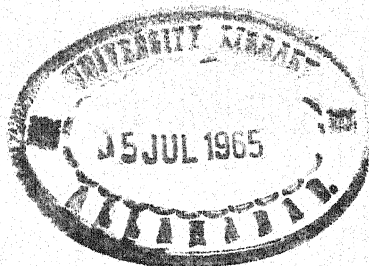


PLANTS
of the
VICINITY OF NEW YORK

By
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Curator
The New York Botanical Garden



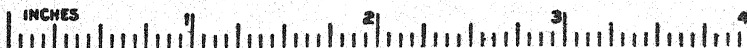
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Preface

We can not talk about plants conveniently without having suitable names for them. We can scarcely look at a plant with satisfaction to ourselves unless we know its name. Our first desire, when we see a new or strange plant, is to learn its name.

The sole purpose of this book is to enable anyone to learn, by his own effort, the name of any of the wild plants which grow in the vicinity of New York. It is not intended for the trained botanist, who might prefer to peer at plants through a microscope or experiment with them in his laboratory. Neither is it for the utterly lazy. It is planned rather for the thousands of Boy Scouts, Girl Scouts, hikers, campers, teachers, tourists, and gardeners who love our wild flowers and need some practical method of learning their names.

The area covered is the territory around New York City. It includes most of Long Island to the east, and extends as far as the Highlands of the Hudson on the north, the New Jersey mountains on the west, and the Pine Barrens on the south. Except for a few rare species, it will serve well for all the region within two hundred miles of New York.

In a district reached by so many means of commercial transportation, additional foreign plants are continually appearing. It is quite probable that several kinds of plants may be found, especially along railways and streets, in vacant lots, and around factories and dump-heaps, which are not mentioned. There may be also some rare plants of our hills and forests which have not yet been noted and which may be discovered at any time by some careful observer. No attempt has been made to include all the numerous kinds of grasses, sedges, pondweeds, and a few other groups, which will have little interest to the majority of those who use the book, or which are too difficult to be named by simple means. These groups have not been omitted, however. All of them may be reached through

the keys, and notice is definitely given at the point beyond which the key is incomplete.

If one stands twenty feet away from a bloodroot or a lady slipper, he can recognize the plant, without any of the elaborate observation of its structural characters demanded by our current manuals of botany. The plant has superficial, easily observable characters sufficient to distinguish it at a distance. Most of these characters can be set down in words and used as the basis of a key for its identification. The keys which follow all depend primarily on the use of such obvious characters, although it has naturally been necessary in many cases to refer to features which require a closer examination. Nevertheless, such obscure or difficult characters as the cells in the ovary and the position of the ovules have been avoided completely.

Botanists may be interested to know that the scientific names follow the usage of the seventh edition of Gray's Manual. The author is of course well aware of certain improvements in our knowledge of American plants since this Manual was published in 1908. None of this progress has been incorporated into the present book, since it might tend to confuse those who consult the Manual as a reference book.

The New York Botanical Garden maintains a separate reference collection, the Local Herbarium, containing about sixty thousand botanical specimens illustrating the native plants of the region. This collection may be consulted without charge daily, including Sundays and holidays, by any interested person.

Structure of Plants

The most conspicuous differences between the various kinds of plants are usually found in the flowers or leaves. Any one can see very easily that the flowers of a violet and a bloodroot are very different, or that the leaves of an oak and a walnut are quite unlike. These differences can often be shown very clearly and easily in pictures, but in books words must generally be used instead. Botanists have hundreds of special words which they use in describing plants. Some of them are nouns, or names given to definite parts of the plant. Others are adjectives, which describe these parts. By means of these terms, a botanist can describe all features of a plant with great completeness and accuracy. Unless one has been trained in botany and become familiar with these words, he will probably not know the meaning of some of them. Since this book has been planned especially for such people, rather than for the trained botanist, every effort has been made to avoid these technical terms as far as possible. Nevertheless, some of them must be used, and in this chapter the meaning of many of them will be explained by words or pictures. All others are defined in the glossary.

1. *Parts of a leaf.* The conspicuous part of every ordinary leaf is flat and green and is often called the *blade*, but in describing it, it is usually referred to simply as the leaf. Most leaf-blades are at the end of a stalk, which is called the *petiole* and is really part of the leaf. In some

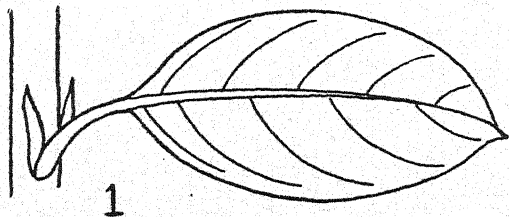


FIG. 1. A complete leaf, showing blade, petiole, and stipules.

leaves, at the very base of the petiole, one on each side, are two small organs called *stipules*. In a few plants the stipules are conspicuous and may be mentioned in this book. In most plants they are small and inconspicuous, or fall off very early, and are not mentioned here at all. In some plants there is no petiole and the leaves are then called *sessile*. In a very few plants the leaves are reduced to small scales or are completely absent. A special key is provided for naming these and other plants of abnormal structure or appearance.

2. *Arrangement of leaves*. Leaves are rather uniformly spaced along the stem, and appear at the joints or *nodes* of the stem. Figure 2 shows the three common types of leaf-arrangement: *alternate* or one leaf at each node, *opposite* or two leaves at each node, and *whorled* or three or

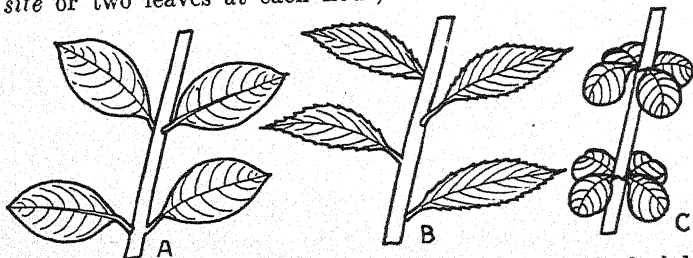


FIG. 2. Arrangement of leaves. A. opposite; B. alternate; C. whorled.

more leaves at each joint. If the leaves all come up from the very base of the plant, they are called *basal* (Figure 14 B). These four terms are also used to describe the arrangement of flowers on the stem.

3. *Simple and compound leaves*. A *simple leaf* has a single blade; a *compound leaf* has two or more blades, each of which is called a *leaflet*. Figure 3 shows some common types of compound leaves. When all the leaves are attached together at the end of the petiole, the leaf is *palately compound*. When they are attached along the sides of the petiole or its continuation, the leaf is *pinnately compound*. If the petiole itself is branched, the leaf is *twice compound*; this is also termed *bipinnate* or twice

pinnate, *bipalmate* or twice palmate. If the petiole is again branched, the leaf is *thrice* or *three times compound*. If the petiole is repeatedly branched, the leaf is sometimes

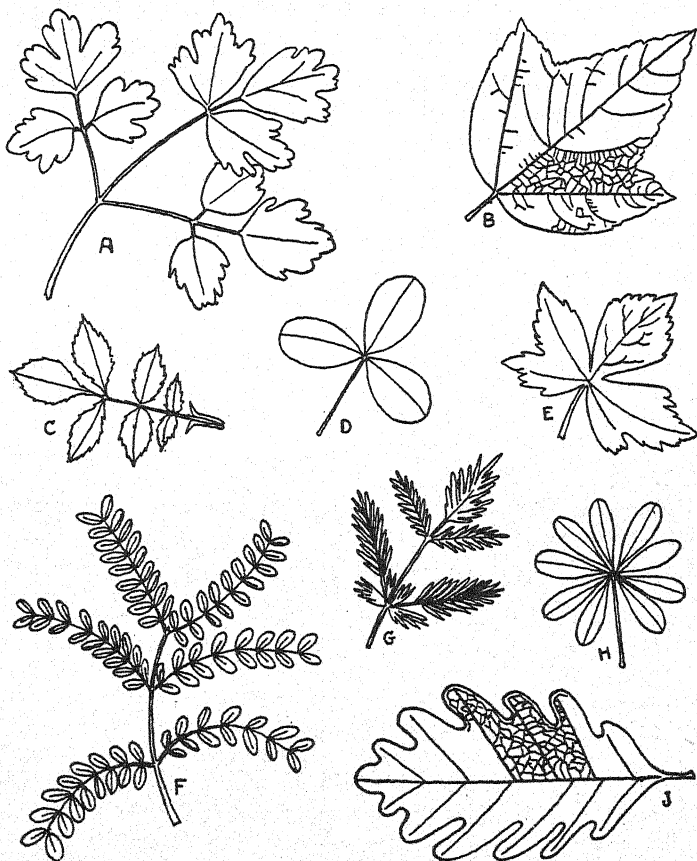


FIG. 3. Types of lobed and compound leaves. A. ternately compound; B. palmately lobed; C. pinnately compound; D. palmately compound or trifoliate; E. palmately cleft; F. twice pinnately compound; G. dissected; H. palmately compound; I. pinnately lobed.

called *decompound* or *dissected*. If the petiole branches by three's, the leaf is ternate or *ternately compound*.

How can one tell a single compound leaf, with its several leaflets, from a cluster of simple leaves? Experience makes it a very easy task, but until experience is gained, the best method is to find the actual base of the petiole. The upper side of a true petiole (Figure 4) is almost always different from the lower side. This is especially plain at its base, where it joins the stem. There the petiole broadens out

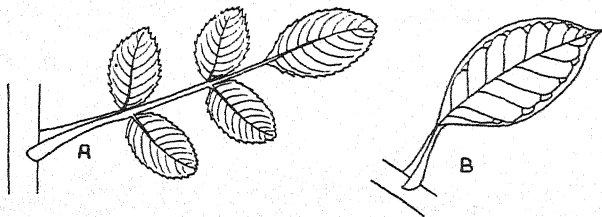


FIG. 4. Simple and compound leaves.

somewhat, and is distinctly flattened or even concave on the upper side. Begin at any leaf-blade and trace down the stalk until this broadened base is found. If there is only one blade above this point, the leaf is simple; if there are two or more, the leaf is compound. Sometimes stipules can be found, which also help to show the actual base of the leaf (Figure 14 C), but there are a few plants with stipules at the base of each leaflet, so they can not always be depended on with assurance. Furthermore, there is usually a difference in color or texture between a petiole and a true stem, especially in shrubs and trees, where the stem is woody and the petiole is green or colored.

4. *Venation of the leaf.* Every leaf has veins, which are usually most conspicuous on the lower side (Figure 5). In some plants with very thick leaves, the veins may be almost invisible. In about a quarter of our plants, all the visible veins are about parallel with each other, running almost always from the base of the leaf to its tip. These are called *parallel-veined*, and are illustrated by the grasses,

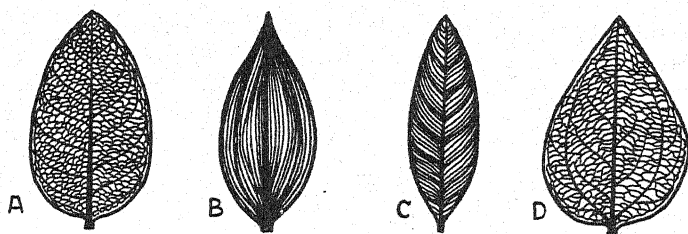


FIG. 5. Venation of leaves. A. pinnately net-veined; B, C. parallel-veined; D. palmately net-veined.

lily, dog-tooth violet, and Solomon's seal. In about three quarters of our plants, even the largest veins are often crooked or branched and there is always a network of the smaller veins, best seen by holding the leaf to the light. These leaves are *net-veined*.

Leaves with one principal vein down the middle, and with branches running out sidewise from it, are *pinnately veined*. If several important veins start together at or near the base of the blade, the leaf is *palmately veined*.

5. *Special types of leaves.* A few special types are illustrated in Figure 6. A *clasping leaf* is one with the base of the blade extending partly around the stem. Clasping leaves are usually sessile. If the base extends completely

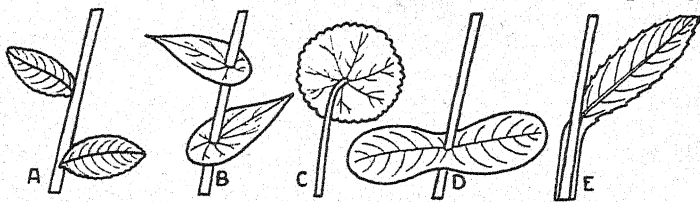


FIG. 6. Types of leaves. A. sessile; B. perfoliate; C. peltate; D. connate; E. decurrent.

around the stem, the leaf is *perfoliate*. If the base extends down the stem as two narrow projecting wings, the leaf is *decurrent*. A pair of opposite leaves connected at their bases around the stem are *connate*. In a *peltate* leaf, the

petiole is not attached to the edge of the leaf-blade, but some distance in from the margin.

6. *Shape of the leaf-blade.* Some common types are shown in Figure 7. It must be carefully remembered that the terms used to describe shape have nothing to do with size or venation, or with the tip or base or margin of the leaf. They refer only to its general outline. There are

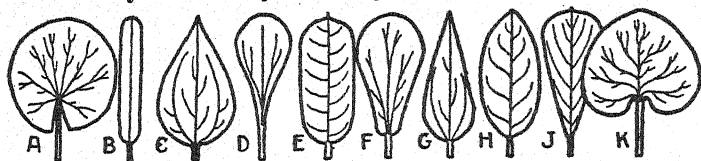


FIG. 7. Shapes of leaves. *A.* round or rotund; *B.* linear; *C.* ovate; *D.* spatulate; *E.* oblong; *F.* obovate; *G.* lanceolate; *H.* elliptical; *J.* oblanceolate; *K.* kidney-shaped or reniform.

leaves of a vast number of different shapes, but only a few words to describe them. One must therefore allow for a reasonable variation in the meaning of each term. One can see that a lanceolate leaf is something between a linear leaf and an ovate one, but there is no rule for deciding how wide a lanceolate leaf can be without being called ovate, or how narrow it may be before it should be called linear. Leaves which are intermediate between two general types are often described by both terms with a hyphen between them, as linear-lanceolate, for a very narrowly lanceolate leaf, or obovate-oblong for one about halfway between oblong and obovate in its shape. In observing the shape of leaves on any plant, one should be careful to select average leaves, avoiding extremes or freak leaves of any kind.

7. *The tip or apex* of the leaf is described by various terms, the commonest of which are illustrated in Figure 8.

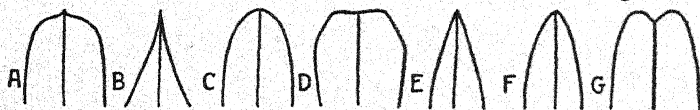


FIG. 8. Apex of leaves. *A.* mucronate; *B.* acuminate; *C.* rounded; *D.* truncate; *E.* acute; *F.* obtuse; *G.* retuse or notched.

These terms apply only to the tip, and have nothing to do with its general shape. Here again one must choose average leaves and must remember that intermediate types may easily be found.

8. *The base of the leaf* is not often referred to in this book, but some of the commoner types are illustrated in Figure 9. Some of the words used for the base are also

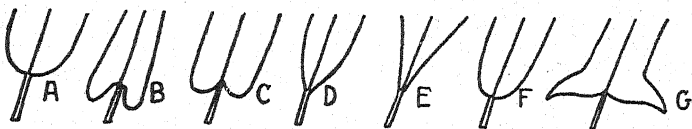


FIG. 9. Base of leaves. A. rounded; B. sagittate; C. heart-shaped or cordate; D. acute; E. acuminate or cuneate; F. obtuse; G. hastate.

used for the tip of the leaf, such as *acute*, *acuminate*, *obtuse*, *truncate*, and *rounded*, while *round*, *heart-shaped* or *cordate*, and *hastate* are sometimes used also for the general shape of the blade.

9. *The margin of the leaf* is very important. Various types are shown in Figure 10, ranging from *entire* leaves with even and unbroken margin to *lobed* leaves. Other common terms are *denticulate* or finely dentate, *serrulate* or finely serrate, *sinuate* or wavy-margined, *spinulose* or bristly and *ciliate* or hairy along the margin. *Cleft* or *divided* leaves are lobed still more deeply, even almost to the base or to the midrib, and sometimes appear almost compound. The angle between two lobes is called the *sinus*. If the sinuses are narrow and sharp, as if the leaf

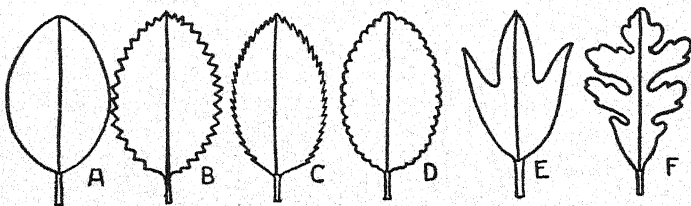


FIG. 10. Margin of leaves. A. entire; B. toothed or dentate; C. toothed or serrate; D. toothed or crenate; E. lobed; F. cleft or divided.

had been cut by shears, the leaf is described as *incised* or *lacinate*. *Pinnatifid* is a common term for leaves which are deeply pinnately lobed, while *twice-pinnatifid* means that the lobes themselves are also pinnatifid. In still other leaves, the blade may be divided into a great number of small parts, in which case it is often called *dissected*. The arrangement of the lobes or deeper divisions always follows that of the principal veins. If a leaf is palmately lobed, it will be palmately veined, or pinnately lobed if it is pinnately veined.

10. *Hairs*. Many kinds of plants, possibly a majority of them, have hairs on the leaves and stems. These hairs vary in length, number, position, and stiffness, and are described by many technical terms. Very few of these terms are used here. Two types of hairy covering are described as *silky* and *woolly*, which need no explanation, and rarely the terms *hirsute* or *bristly* are used for hairs which are stiffer than usual.

11. *Sizes of flowers*. Every one knows that flowers range in size from very small to very large. No matter what their size, they are all constructed on the same general plan. If they are tiny, it may be difficult to see or to understand their structure without a good magnifying glass. It will rarely be necessary, in using this book, to look into the structure of small flowers. Even in large flowers, there are some important structures which are often not readily seen, and these have also been avoided as far as possible. But one must know what the parts of a flower are, and must understand the general way in which these parts are arranged.

12. *Parts of the flower*. In an ordinary flower, such as a violet, a spring beauty, a buttercup, a toothwort, or a bloodroot, four general kinds of structures may be found (Figure 11). Beginning at the outside, these are first the *calyx*, usually green in color and composed of two or more *sepals*. The calyx is often most easily visible when the flower is in bud, and sometimes drops off when it opens. Second is the *corolla*, composed of two or more *petals*, often white or colored, and generally the most conspicuous part

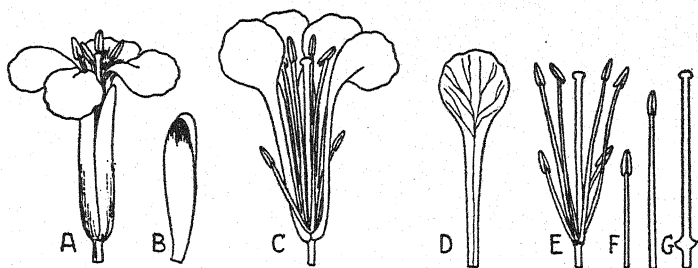


FIG. 11. Parts of a flower. A. complete flower; B. a single sepal removed; C. flower after removal of the sepals; D. a single petal; E. flower after removal of the petals; F. two stamens, long and short; G. the pistil.

of the flower. Third in order are the *stamens*, few or several or many in number, and each generally consisting of a slender stalk called the *filament* and a terminal *anther*, usually yellow or pink in color. Lastly, in the very center of the flower, we find one or more *pistils*, each composed of a swollen base, the *ovary*, within which the young seeds or ovules are produced, surmounted by a slender *style* bearing a terminal *stigma*. The shape, base, apex, and margin of sepals and petals are described by the same terms used for leaves.

Not all flowers are as easy to understand as the examples just mentioned. Just a few of the variations will be described here. In some flowers the calyx and corolla are very much alike in their size and color. In such cases, the word *perianth* is sometimes used to refer to both calyx and corolla together. In a dog-tooth violet, for example, there appear to be six yellow petals. Three of these are actually outside the others and are the sepals, while only the three inner ones are really petals. In many kinds of plants some of the four sets of parts are missing. A marsh marigold, for example, has no green sepals. Many weedy plants have no corolla. Many of our trees and shrubs and a few herbaceous plants have either stamens or pistil, but not both, in any one flower. Stamens may sometimes be found with-

out a filament. In many plants the pistil has no style between the ovary and the stigma.

In Figure 11, the sepals, petals, stamens, and pistil are all separate from each other, and may be taken off one at a time. In many other plants, the parts of the flower are grown together in various ways. Very often the petals are grown together at the base (Figure 12 *C*) or even almost completely (Figure 12 *A*), so that the whole corolla can be

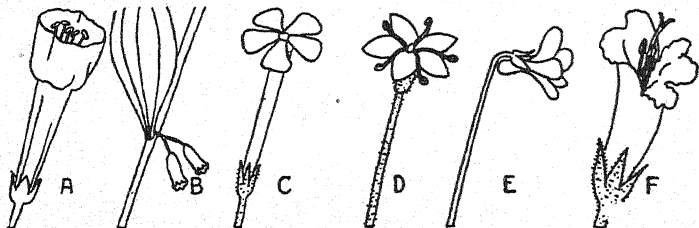


FIG. 12. Types of corollas. *A*. trumpet-shaped; *B*. tubular; *C*. salver-form; *D*. rotate or wheel-shaped; *E*. irregular, with a spur; *F*. irregular and two-lipped.

pulled off in one piece. The shapes of such corollas are described as *trumpet-shaped*, *tubular*, *salver-form*, *rotate* or *wheel-shaped*, all of which are illustrated, and also as *bell-shaped* and *funnel-form*, which need no definition. The same terms are used for a calyx with united sepals. The projecting lobes at the end of such a corolla or calyx indicate the actual number of petals or sepals. If very short, they are sometimes called *teeth* instead of lobes. The united portion toward the base, below the lobes, is the *tube* of the calyx or corolla. In some plants the stamens are grown together and form a tube wholly or partly surrounding the pistil.

In most of our spring flowers all the petals are alike in size and shape, and such flowers are called *regular*. In the violet, the Dutchman's breeches, and many others, some of the petals are distinctly unlike the others, and the flowers are then called *irregular* (Figure 12 *E*, *F*).

The number of sepals and petals varies considerably, but most plants have either 3, 4, or 5 of each. The number of

stamens ranges from 2 to a hundred or more, but most plants have from 2 to 10. The great majority of plants have only a single pistil, possibly with more than one style or stigma, but in the buttercup, wild strawberry, and several others there is a large number of pistils.

In using this book, the reader will often be asked to find the number of sepals, petals, stamens, or pistils, and these should be counted with care. He may also be asked whether the petals or the stamens are grown together. Such questions will not be asked unless they can be answered easily, but care must be taken to observe correctly.

13. *Unusual types of flowers.* There are four groups of plants in the vicinity of New York which have flowers of such an unusual structure that they may easily mislead the student. These are the orchids, the spurges, the milkweeds, and the composites. In the orchids and the milkweeds, the stamens are so modified that they are scarcely recognizable. In the spurges and the composites, what appears to be a single flower is really a cluster of several or many small flowers. The book is so arranged that it is possible to name these plants without understanding their strange structures, but each of them is described in some detail in its appropriate place (Figure 15).

Several kinds of flowers have *spurs*, which are conical or sack-like hollow projections extending backward from the base of the flower. The columbine has five spurs, the Dutchman's breeches two, and the violet one. Honey is secreted in the spurs and attracts bees to the flowers.

14. *The flower-cluster.* Flowers may grow singly, or they may be more or less massed in clusters. A few simple types of flower-clusters are illustrated in Figure 13. These are the *raceme*, with an elongated axis bearing each separate flower on its own little stalk or *pedicel*; the *spike*, with an elongated axis but with sessile flowers; the *umbel*, with the pedicels arising very close together at the end of the flower-stalk; the *compound umbel*; the *head*, with the flowers all sessile in a very tight and dense cluster; the *panicle*, a loose, open, branching cluster; and the *catkin*, which is a spike of small flowers without petals, and with

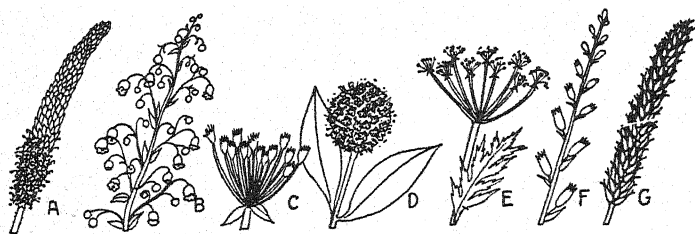


FIG. 13. Types of flower-clusters. A. spike; B. panicle; C. umbel; D. head; E. compound umbel; F. raceme; G. catkin.

either stamens or pistils, but not both. Catkins are produced by many of our trees and shrubs in early spring, such as the willow, poplar, oak, and hazel.

* 15. *Position of flowers.* When the leaves are all basal, the flower-stalk also arises directly from the ground and is called a *scape*. A scape may bear only one flower, as the violet, or several flowers in a cluster (Figure 14 B). In

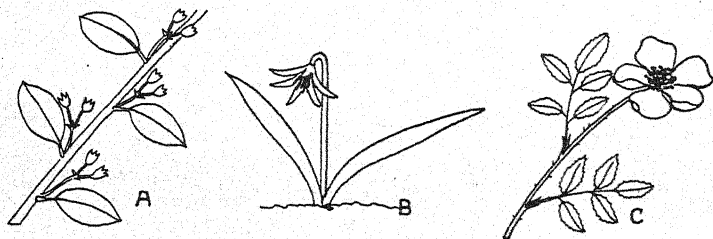


FIG. 14. Position of flowers. A. axillary; B. basal, on a scape; C. terminal.

many plants, the flowers or flower-clusters are produced from the stem just above the base of a leaf. This angle between the petiole and the stem is called the axil of the leaf, and flowers or flower-clusters in this position are *axillary* (Figure 14 A). Many other plants bear their flowers or flower-clusters at the end of the stem or its branches and these are *terminal* (Figure 14 C).

16. *Bracts.* Very often one finds on the flower-stalk or on the branches of the flower-cluster small green or scale-

like organs, which occupy the place of leaves, but which are smaller in size or different in shape or color from the normal leaves of the plant (Figure 13 *B, F*; 14 *A*). These small organs are the *bracts*; the uppermost ones, usually still smaller in size, are the *bractlets*. A set of bracts located close together and near the flower is an *involucre*.

17. *Herbaceous and woody plants*. An *herb* or *herbaceous plant* dies down to the ground, or dies completely, every autumn. A *woody plant*, which may be a *shrub* or a *tree* or a *woody vine*, has stems which live above ground all winter and continue their growth the following spring. Woody plants can generally be recognized by their tougher or more solid stems, but the better way is to observe that they have stems of two sorts. The older parts, produced last year or even longer ago, are thicker, tougher, and often darker colored, while the new parts, produced this year, are often quite soft or almost herbaceous in their color or texture.

18. *Evergreen and deciduous plants*. Deciduous plants drop their leaves in autumn. Evergreens keep their leaves over winter. In evergreens, some of last year's leaves therefore appear on the old wood and are generally thicker or harder or tougher or darker colored than the new leaves on the young stems.

19. *Names of plants*. Every kind of plant in the vicinity of New York has a scientific name and most of them have English names or common names also. A few are so rare or so inconspicuous that they have never acquired a common name, and they are best called by the name of the genus. Often a single common name applies to many different kinds of plants, such as violet and sun-flower and many others. If it is desirable to specify any particular kind of violet or sun-flower the scientific name should be used.

Each scientific name consists of two words, which are Latin or Greek in their form and derivation. The first of these words usually belongs to several kinds of plants, although only one kind may be given in this book. For example, all our many kinds of goldenrod are named

Solidago and all kinds of oak are named *Quercus*. The second half of the name indicates a particular kind of plant in this group, and every one of its kinds has a different name. For example, some of our common kinds of golden-rod are named *Solidago caesia*, *Solidago rugosa*, *Solidago juncea*, and *Solidago speciosa*. One definite kind of plant is known in botany as a *species* and a group of species, all much alike in their structure and appearance, is a *genus*. Thus the genus *Solidago* has about a hundred species in the United States and about twenty in the vicinity of New York. A variety is distinguished from the species to which it belongs by some slight difference in structure and its name is added to the name of the species. Very few varieties are given in this book.

Scientific names are always used by botanists and horticulturists to indicate precisely and accurately any species of plant. The scientific names in this book are those used in Gray's New Manual of Botany, seventh edition.

Glossary

- Achene.* A small dry seed-like fruit.
- Annual.* Living but a single season.
- Apetalous.* Without petals.
- Appressed.* Lying close to some other part of the plant, as appressed hairs or leaves.
- Aquatic.* Growing in water.
- Ascending.* Rising or curving obliquely upward.
- Awn.* A slender or bristle-like appendage at the end of an organ.
- Axis.* An elongated central body, from the sides of which other organs are produced, as the axis of a raceme or of a compound leaf.
- Basal.* At or near the base; arising or produced from the base.
- Beak.* A stout or prominent terminal appendage.
- Bracteal.* Pertaining to, or serving as, a bract.
- Bulb.* A rounded, thickened basal portion of a stem.
- Bulbous.* Like a bulb in structure or appearance.
- Capsule.* A dry fruit, with several or many seeds, opening at maturity.
- Cauline.* Produced on, or pertaining to, the stem.
- Cells of ovary.* The one or more cavities within an ovary.
- Channeled.* With a shallow lengthwise depression.
- Cordate-ovate.* Ovate in shape with a heart-shaped base.
- Cordate-sagittate.* Intermediate between heart-shaped and sagittate.
- Corymb.* A freely branched, rounded or flat-topped flower-cluster.
- Creeping.* Lying on the ground and taking root at the joints.
- Declined.* Bent down.
- Decumbent.* Prostrate at or near the base, but beyond the base ascending.
- Dehiscent.* Breaking open at maturity to discharge the contents.
- Diffuse.* Widely and rather freely or densely branched.
- Dioecious.* Bearing the staminate and the pistillate flowers on separate plants.
- Disk.* The central part of the head in a radiate composite; also a fleshy organ near the base of the stamens in some flowers, as in the Celastraceæ.
- Divergent.* Spreading out from the axis.
- Doubly pinnatifid.* Twice deeply pinnately lobed.

- Ellipsoid*. Shaped like a football.
- Emersed*. Growing beneath the water but rising above its surface.
- Erect*. Growing in a vertical position.
- Fascicled*. Borne in close crowded clusters.
- Fertile*. Bearing flowers or other reproductive bodies.
- Filiform*. Very narrowly linear.
- Gamopetalous*. Composed of united petals.
- Glaucous*. With a thin bluish or whitish deposit on the surface, usually easily rubbed off.
- Glutinous*. Sticky or viscid.
- Imperfect*. Bearing either stamens or pistils, but not both.
- Indehiscent*. Not breaking open at maturity to discharge the contents.
- Inferior ovary*. An ovary apparently located beneath the calyx and appearing as a small swelling at the tip of the pedicel.
- Inflorescence*. A general term to denote any sort of flower-cluster or the arrangement of flowers on the plant.
- Internode*. A portion of the stem between two sets of leaves or between two joints where leaves are produced
- Interrupted*. Not continuous or complete.
- Involucral*. Pertaining to, or serving as, an involucre.
- Lateral*. Produced on the side of a stem or other organ.
- Leaf-segment*. One of the divisions of a deeply lobed or divided leaf.
- Lip*. The largest and most conspicuous petal in an orchid; in other irregular flowers, either the upper or the lower part of the corolla, when these parts are different in size or shape.
- lipped*. Provided with lips, in an irregular calyx or corolla.
- Midvein*. The central principal vein of a leaf.
- Monoecious*. Bearing the staminate and pistillate flowers separately, but on the same plant.
- Nerve*. A vein in a leaf or other organ.
- nerved*. Provided with nerves or veins.
- Nocturnal*. Opening at night.
- Obconic*. Reverse cone-shaped, with the point down.
- Obcordate*. Reverse heart-shaped, with the point down.
- Obovoid*. Shaped like an egg upside-down.
- Once-pinnate, -compound, -ternate, -pinnatifid*. The prefix once emphasizes the contrast with twice-pinnate, -compound, etc.
- Orbicular*. Circular in outline.
- Ovate-cordate*. Ovate, with a heart-shaped base.

Ovoid. Egg-shaped.

Parasitic. Attached to other plants and depending upon them for food supply.

Pedicelled. Provided with a pedicel.

Peduncle. The stalk of a flower-cluster or of a solitary flower.

Perennial. Living more than one season.

Perfect. Bearing both stamens and pistil in the same flower.

Pinna. One lateral division of a pinnately compound or lobed leaf.

Pistillate. Bearing pistils but no stamens.

Prostrate. Lying flat on the ground.

Pubescent. Bearing hairs on the surface.

Receptacle. The very tip of the pedicel, to which the parts of the flower are attached.

Recurved. Curved backward.

Reflexed. Bent abruptly backward.

Revolute. With the margin somewhat rolled under.

Rhachis. The axis of a flower-cluster or a compound leaf, appearing as a continuation of the peduncle or petiole.

Rhombic-ovate. Egg-shaped in general outline, but tending to have four flattened sides, like a rhomb.

Rib. A prominent lengthwise vein in a leaf.

Rootstock. An underground stem, usually horizontal.

Rosette. A close cluster of basal leaves.

Scale. Any small flat structure.

Segment. A portion of a deeply divided leaf.

Sessile. Without a petiole, peduncle, or pedicel.

Sheath. An organ which surrounds the stem.

Sheathing. Surrounding the stem like a sheath.

Smooth. Without hairs.

Spadix. A thick fleshy spike.

Spathe. A conspicuous leaf or leaves wholly or nearly surrounding a flower-cluster.

Staminate. Bearing stamens but not pistils.

Sterile. Not bearing reproductive bodies (spores, pollen, seeds).

Stipular. Pertaining to or resembling a stipule.

Stolon. A leafy basal horizontal stem which eventually takes root and becomes an independent plant.

Submerged. Growing entirely under water.

Subtend. To be situated at the base of some designated organ, as a leaf subtends a flower, or a flower is subtended by a bract.

Subulate. Awl-shaped.

Superior ovary. An ovary which lies in the center of the flower in its normal position.

Tendril. A small organ of some climbing plants, which coils around a support.

Thread-like. Very narrowly linear.

Trifoliate. Having three leaflets.

Tufted. Growing in dense bunches.

Unisexual. Bearing stamens or pistils, but not both in the same flower.

Urn-shaped. Cup-shaped with a narrowed or constricted mouth.

Whorled. Arranged in whorls.

How to Use the Book

Any book of this nature is composed of a series of tables called *keys*. There are several ways of arranging keys on a printed page, but they are all constructed on the same general principle. The arrangement of keys in this book can be seen on page xxvi. Each key consists of a number of sets of statements about plants. Each set is given a number, and to avoid any confusion by the reader, each even-numbered set is indented somewhat. In this first key there are five such sets, numbered from 1 to 5. In each set there are always at least two statements and there may be more. These statements are distinguished by letters. Thus in set 1 there are three statements, 1a, 1b, and 1c. The statements of each set always contrast strongly with each other; for example, 2a reads *aquatic plants* and 2b reads *land plants*. In naming a plant, one will always find that one of these statements will apply accurately to the plant being studied, while the other one will not apply at all. At the end of each statement there is always a number or a word of further directions. Thus at the end of 2a, printed in heavy type, we read *II. Aquatic plants, p. xlviii*, while at the end of 2b, we find the number —3.

In naming a plant, the reader must always begin with number 1 in the Key to the Groups. He must read 1a, 1b, and 1c carefully and select the particular one which applies to his plant. That means that the printed statements must be compared with the plant itself and that the proper statement must be selected accurately. If the plant is a tree or shrub, it fits 1a; if it is a climbing vine, it fits 1c. If it is a tree, he next follows the directions at the end of that line and turns to page xxviii, but if it is a vine, he turns instead to page lxxxiv. If it is an herbaceous plant, he is referred to 2, which means the next set of statements and is found just below set 1. This process is continued until the name of the plant is reached. It will generally require that the reader makes about fifteen decisions about his plant under

as many different sets, and in every case follows the directions at the end of the line.

This may best be shown by an example. Let us take a white water lily. Of course every one knows the name of this plant, but we can suppose that we never saw one before and do not know what it is. First we look carefully at the plant, as it grows in the water. We see that its leaves all float on the surface of the water, and that the leaves and the flowers all come up from the same place at the bottom of the pond. There are no branches, and there are no leaves on the flower-stalk. The leaves are round in general outline, but not perfectly so. On one side there is a deep cut which extends from the margin right up to the center where the petiole is attached. The flowers have many petals and are about 10 cm. wide.

Next we turn in the book to the Key to the Groups and read all three statements under number 1. With which of these three does our water lily agree? Certainly it is not a shrub or a tree and can not fit number 1*a*; neither is it a climbing vine and so can not go in 1*c*. But it is an herb, and fits that statement under 1*b*. At the end of 1*b* we find the number —2. That tells us where to go next, and we find number 2 just below. Here we have two statements to choose from, 2*a* and 2*b*. The water lily is certainly aquatic and has floating leaves; it fits exactly with 2*a*. It can not fit with 2*b*, because that reads *land plants*. At the end of 2*a* we are directed to another key, II. *Aquatic Plants*, on page xlviii, and we turn next to that page.

Here the series of numbers begin at 1 again, and there are four statements from which we must choose. The first word of each is really all we need look at, since our plant has floating leaves. Without any hesitation we choose 1*d*, and at the end of that statement we are directed to 22. There we have two alternatives. Our plant is attached to the soil at the bottom of the pond, so we choose 22*b* and follow the direction to number 24. Now we find no less than five statements to be considered. We look carefully at the leaves of our plant, compare them with each statement in turn, and finally decide that they do not match

with any of the first four, leaving us with the last statement, 24e. This sends us to 27. We see that the leaves all come up from the very base of the plant, choose 27a, and go on to 28. There the large flowers decide for 28a, and at the end of the line we read *Nymphaeaceae*, p. 56. We turn to that page and find that *Nymphaeaceae* is the Water Lily Family. There is a short description of the family, followed by another short key. Here we choose 1a, referring to 3, and lastly 3a, which gives the name of the plant, White Water Lily, *Castalia odorata*. To find its name we have had to make nine different choices in nine different sets of statements. All of them have been easy to make and have led us directly to the name of the plant in less than five minutes of time.

This example has been taken from a plant already known to us. Let us take one more example that the reader may not know. If he visits the Botanical Garden in May he will probably see a tree in bloom, with opposite, simple, heart-shaped leaves about 10 cm. wide, and blue flowers about 5 cm. long, with their petals united into a tube. What is it?

We shall begin again with the Key to the Groups. Since our plant is a tree, we select 1a and turn to Group I. Here we begin a new key and select 1a, since our plant is a tree. We are referred to 2, where we choose 2c, for trees with both flowers and leaves, and turn over to 58. The broad leaves fit with 58b and send us to 59. The opposite leaves direct us to 60, and the simple leaves send us on to 63. The large irregular flowers with united petals agree with 63d, and we go to 64. Here the blue flowers tell us that the tree is the Empress Tree, and if we want the scientific name we can turn on to 4c, in the *Scrophulariaceae*, page 134, which describes the plant briefly and gives the name *Paulownia tomentosa*.

Every other plant can be handled in the same general way. First we try the Key to the groups, and find the proper group. Second, in the key to this group, we find the name of the family and are referred to the main body

of the book. There we have a third key and get the name of the plant.

For accurate work, observe the following suggestions:

1. Plants are best named in the fields or woods where they grow. If you must take a piece of the plant home to be named, look carefully at the rest of it before leaving.

2. Read every statement under the number to which you are referred. There are always two and sometimes more. Even though the first statement fits your plant, read the others also.

3. Observe the plant carefully and accurately and take pains to make the proper choice of statement. If terms are used which you do not fully understand, consult the glossary or read again the chapter on the structure of plants. These terms will soon be familiar to you.

4. After choosing the proper statement, follow *precisely* the directions at the end of the line. If only a number is given, it refers to the same key, and will be found not far below and in the same series of numbers. If the reference is to a different part of the book, the page number is given.

5. If you have unfortunately made a mistake, and chosen the wrong statement or followed a wrong direction, you will soon reach a number where not one of the statements agrees with your plant. That will show that an error has been made. Start again and be more careful.

6. A magnifying glass is generally not necessary but is always a great help in counting stamens and making various other observations.

7. Often several kinds of plants have the same common name. In such cases, you will reach the common name before your work is finished. If you are satisfied with the common name you may stop at this point, but if you wish to know the particular kind of a plant which you have, you must continue until the scientific name is reached. All woody plants and vines have their common names in the group key.

8. Measurements of size and statements about shape of leaves and color of flowers refer to average or normal

plants. Be careful to make your observations on average plants and avoid all kinds of freaks.

9. Measurements are always made in the metric system, and a metric scale is printed on the back of the title page. One inch is equal to 25 millimeters (abbreviated mm.) or 2.5 centimeters (cm.); a foot is equal to 3 decimeters (dm.). Heights of tall plants may be given in meters (m.); a meter is about 3 feet.

10. In some groups of plants it is very difficult to distinguish species accurately. Some of these have been omitted (Hawthorns, Blackberries, Pondweeds), and in several other cases reference to a Manual is recommended. The standard manual at present is Gray's New Manual of Botany, seventh edition, which may be consulted in many libraries. It contains full descriptions and often pictures of all our native plants.

Key to the Groups

- 1a. Woody plants, including trees, shrubs, and woody vines (For woody vines see also 1c below). These plants all have stems which last over winter above ground and resume their growth the following year. A few shrubs are so small that they may be mistaken for herbs, and these may be sought either in this group or through 1b below

I. Woody plants, p. xxviii.

- 1b. Herbaceous plants, with stems which die down to the ground every fall (For herbaceous vines see also 1c below) —2

- 1c. Vines, with stems which are unable to support themselves and habitually climb upon other plants or fences or walls, or which may trail on the ground if no support is available for them

VI. Vines, p. lxxxiv.

- 2a. Aquatic plants, with submerged or floating leaves. This group includes all plants which habitually grow in water and bear their leaves either under water or floating on its surface. It does not include plants like the cat-tail and many others, which often grow in water but have stems rising above the water and bearing leaves in the air; nor does it include plants temporarily covered by water after rains or floods

II. Aquatic plants, p. xlviii.

- 2b. Land plants of either dry or wet soil, or plants growing in water with their leaves and stems regularly rising above the surface —3.
- 3a. Plants of unusual habits or structures, including plants without green color, parasitic and insect-catching plants, leafless plants, and plants with hollow leaves, thick, fleshy leaves, or leaves reduced to small scales only

III. Unusual plants, p. li.

- 3b. Plants of normal habits and structures —4.

- 4a. Ferns and their allies; plants which never bear flowers or seeds but produce minute spores instead. Most of these plants are fern-like in appearance; a few are floating or submerged and may be found under Group II, and some have small leaves or lack green color and may be found in Group III

Ferns and their allies, p. 1.

4b. True flowering plants, producing flowers at the proper season, followed by seeds—5.

5a. Leaves parallel-veined, usually grass-like or lily-like in appearance; petals almost always 3 or 6, or in some cases none (See note below) **IV. Herbaceous Monocotyledons**, p. liv.

5b. Leaves net-veined; petals almost always 4 or 5 or none (See note below) **V. Herbaceous Dicotyledons**, p. lvii.

Note: The chief difference between the members of groups IV and V is in the structure of the seeds and stem, and these features can not always be seen readily. Any plant with distinctly net-veined leaves may be sought under group V, and any with parallel-veined leaves under group IV. It may be difficult to decide about the veins of narrow or thick leaves, and in such cases the number of petals may help to decide.

As a further aid in distinguishing the last two groups, the following points may be useful. All plants with compound leaves or deeply-lobed leaves may be found in group V. All plants with grass-like leaves sheathing the stem at their base are in group IV. All plants which have flowers with 4 petals are in group V, except one, and that one has lily-like, parallel-veined leaves. All plants with 5 or 7 or more petals are in group V. All plants with 5 or 7 stamens, and all with more than 7 stamens and one ovary in each flower are in group V. A few plants in group V have 3 petals, but their leaves are distinctly net-veined. A very few have parallel-veined leaves, but their flowers have more than 3 petals. Many plants of group V have no petals, but their leaves are almost all definitely net-veined and are never grass-like or lily-like in appearance. In group IV, many plants have small flowers without petals, but their leaves are then distinctly grass-like in appearance or plainly parallel-veined, and almost always sheath the stem at their bases. If petals are present in plants of group IV, their number is either 3 or 6, except one plant with 4 petals, but with parallel-veined, lily-like leaves.

I. Woody Plants

- 1a. Trees, with a well developed trunk and reaching heights of more than 6 m. (20 feet)—2.
- 1b. Shrubs, without a well developed trunk and reaching heights of less than 6 m. (20 feet) (flowers are in many cases necessary for identification)—122.
 - 2a. Key for use with trees bearing leaves but no flowers—3.
 - 2b. Key for use with trees bearing flowers but no leaves—44.
 - 2c. Key for use with trees bearing both leaves and flowers—58.
 - 2d. Key for use with trees bearing fruits or seeds—89.
- 3a. Leaves needle-like, awl-shaped, linear, or scale-like, mostly evergreen Pinaceae, p. 8.
- 3b. Leaves flat, certainly more than 5 mm. wide, mostly falling in the autumn—4.
 - 4a. Leaves opposite or whorled—5.
 - 4b. Leaves alternate—6.
- 5a. Leaves compound—7.
- 5b. Leaves simple—8.
 - 6a. Leaves compound—11.
 - 6b. Leaves simple—15.
- 7a. Leaflets 3 or 5, coarsely toothed (Box Elder) 1c, in Aceraceae, p. 93.
- 7b. Leaflets 7 or more, finely toothed (Ash) Oleaceae, p. 114.
- 8a. Leaves lobed (Maple) 1a and 1b, in Aceraceae, p. 92.
- 8b. Leaves toothed 21, in Caprifoliaceae, p. 143.
- 8c. Leaves entire—9.
- 9a. Leaves oblong or ovate, distinctly longer than wide; lateral veins curved forward almost parallel to the margin; leaf-scars very small (Dogwood) 3a, in Cornaceae, p. 108.
- 9b. Leaves broadly heart-shaped, palmately veined, nearly or quite as wide as long; leaf-scars very large—10.
 - 10a. Pith divided into separate chambers (Catalpa) 4c, in Scrophulariaceae, p. 134.
 - 10b. Pith not divided into chambers (Empress Tree) 1b, in Bignoniaceae, p. 140.
- 11a. Leaflets entire throughout their whole length; stem or branches thorny—12.

- 11b. Leaflets entire, except for a few large, gland-bearing teeth near their base; thorns none (Tree of Heaven)

Simarubaceae, p. 87.

- 11c. Leaflets toothed throughout or nearly throughout their whole length; thorns none—13.

- 12a. Leaves odd-pinnate, with a terminal leaflet (Black Locust)

4a, in Leguminosae, p. 78.

- 12b. Leaves evenly pinnate, without a terminal leaflet (Honey Locust)

2d, in Leguminosae, p. 78.

- 13a. Juice milky (best seen by puncturing bark or at the base of a broken leaf-stalk) (Sumach)

4b, in Anacardiaceae, p. 91.

- 13b. Juice not milky—14.

- 14a. Terminal leaflet less than 25 mm. wide (Mountain Ash)

2a, in Rosaceae, p. 72.

- 14b. Terminal leaflet more than 25 mm. wide

Juglandaceae, p. 39.

- 15a. Leaves lobed—16.

- 15b. Leaves toothed—22.

- 15c. Leaves entire—39.

- 16a. Stems thorny (Hawthorn)

22c, in Rosaceae, p. 75.

- 16b. Stems not thorny—17.

- 17a. Leaves palmately veined, with 3 or more veins arising right at the base and distinctly stronger than the others; margins of the leaf-lobes more or less toothed—18.

- 17b. Leaves palmately veined, the 3 principal veins arising a short distance above the base; lobes of the leaf entire; taste and odor when crushed pleasantly aromatic (Sassafras)

1b, in Lauraceae, p. 62.

- 17c. Leaves pinnately veined, with a single principal midvein—21.

- 18a. Leaves silvery white beneath (White Poplar)

4a, in Salicaceae, p. 38.

- 18b. Leaves green beneath—19.

- 19a. Juice milky (best seen at the base of a broken leaf-stalk) (Mulberry)

3, in Urticaceae, p. 44.

- 19b. Juice not milky—20.

- 20a. Leaves star-shaped with 5 triangular lobes, their margins finely and regularly toothed (Sweet Gum)

1b, in Hamamelidaceae, p. 72.

- 20b. Leaves not star-shaped, their margins coarsely and sharply toothed; petioles hollow at base (Sycamore)
Platanaceae, p. 72.
- 21a. Lobes of the leaf 3, all near the end, each tipped with a short bristle (Black Jack Oak) 6a, in *Fagaceae*, p. 43.
- 21b. Lobes of the leaf 4, 2 on each side, the margin of the lobes entire; whole leaf broadly and shallowly notched at the end (Tulip Tree) 1b, in *Magnoliaceae*, p. 61.
- 21c. Lobes of the leaf several or many (Oak)
 1c and 1d, in *Fagaceae*, p. 41.
- 22a. Leaves spiny on the margin, thick and leathery, evergreen (Holly) 1a, in *Aquifoliaceae*, p. 92.
- 22b. Stem with thorns, the leaves not spiny on the margin—23.
- 22c. Thorns and spines none—25.
- 23a. Thorns very sharp, not bearing leaves (Hawthorn)
 22c, in *Rosaceae*, p. 75.
- 23b. Thorns rather blunt, often bearing leaves—24.
- 24a. Principal lateral veins only 2 or 3 on each side of the mid-vein, curving forward toward the apex (Buckthorn)
 3b, in *Rhamnaceae*, p. 94.
- 24b. Lateral veins several, running toward the margin of the leaf (Wild Plum) 14a, in *Rosaceae*, p. 74.
- 25a. Leaves very inequilateral at base, one side of the leaf regularly and distinctly larger than the other—26.
- 25b. Leaves nearly or quite symmetrical and equilateral—29.
- 26a. Lateral veins running straight and parallel from the mid-vein to the margin—27.
- 26b. Lateral veins curved or branching, not extending straight to the margin—28.
- 27a. Leaves rough on the upper side, their teeth sharp (Elm)
 4a, in *Urticaceae*, p. 44.
- 27b. Leaves smooth on the upper side, their teeth rounded (Witch Hazel) 7d, in *Hamamelidaceae*, p. 72.
- 28a. Leaves heart-shaped, nearly or quite as wide as long (Basswood) *Tiliaceae*, p. 95.
- 28b. Leaves oblong to lanceolate, much longer than wide (Hackberry) 4b, in *Urticaceae*, p. 44.
- 29a. Leaves coarsely toothed, with only 1 or 2 teeth per centimeter of margin—30.

- 29b. Leaves finely toothed, with 3 to many teeth per centimeter of margin—31.
- 30a. Petioles laterally compressed; leaves nearly or quite as wide as long 1a, in *Salicaceae*, p. 37.
- 30b. Petioles not compressed; leaves distinctly longer than broad 2, in *Fagaceae*, p. 43.
- 31a. Lateral veins strongly developed, running straight and parallel from the midvein to the margin and ending in the teeth *Betulaceae*, p. 40.
- 31b. Lateral veins weak, or curved, or crooked, or branched, at least not running straight from the midvein to the margin—32.
- 32a. Juice milky (best seen at the base of a broken leaf-stalk) (Mulberry) 3, in *Urticaceae*, p. 44.
- 32b. Juice not milky—33.
- 33a. Leaves linear-lanceolate, 6–10 times as long as wide; twigs very slender and brittle (Willow) 5a, in *Salicaceae*, p. 38.
- 33b. Leaves lanceolate to broadly ovate, very rarely more than 4 times as long as wide—34.
- 33c. Leaves broadly heart-shaped or almost triangular, nearly or quite as wide as long 1a, in *Salicaceae*, p. 37.
- 34a. Many of the leaves closely clustered at the end of short spur-like branches (Apple) 22a, in *Rosaceae*, p. 75.
- 34b. Leaves all scattered on the twigs, the spur-like branches none—35.
- 35a. Bark tending to separate into thin or papery layers; pith whitish or brownish—36.
- 35b. Bark not separating in thin layers; pith greenish (Junberry) 26a, in *Rosaceae*, p. 75.
- 36a. Teeth of the leaves with sharp spreading points—37.
- 36b. Teeth of the leaves with blunt or incurved points (Cherry)—38.
- 37a. Leaves ovate, tapering to the tip (Wild Plum) 14a, in *Rosaceae*, p. 74.
- 37b. Leaves obovate, blunt at the tip (Choke Cherry) 12b, in *Rosaceae*, p. 74.
- 38a. Leaves flat or nearly so on both sides, the veins on the lower side almost imperceptibly raised above the surface (Black Cherry) 12a, in *Rosaceae*, p. 74.

- 38b. Leaves with the principal veins impressed on the upper side and on the lower side strongly raised above the surface
15, in Rosaceae, p. 74.
- 39a. Stems thorny; juice milky (Osage Orange)
2c, in Urticaceae, p. 44.
- 39b. Stems not thorny; juice not milky—40.
- 40a. Leaves and crushed bark pleasantly aromatic in taste and odor; leaves palmately veined, the principal lateral veins arising from the mid-vein a short distance above its base (Sassafras)
1b, in Lauraceae, p. 62.
- 40b. Leaves and bark not pleasantly aromatic; leaves pinnately veined—41.
- 41a. Leaves very thick and leathery, evergreen, persistent on the older branches (Rhododendron) 19a, in Ericaceae, p. 111.
- 41b. Leaves deciduous, of ordinary thickness and texture—42.
- 42a. Leaves narrowly lanceolate, tipped with a short bristle (Willow Oak)
1a, in Fagaceae, p. 41.
- 42b. Leaves broadly ovate to obovate, not tipped with a bristle—43.
- 43a. Bundle-traces 3 in each leaf-scar (Black Gum)
2b, in Cornaceae, p. 108.
- 43b. Bundle-trace one in each leaf-scar (Persimmon)
Ebenaceae, p. 114.
- 44a. Flowers (at least the staminate ones) in slender catkins in early spring—45.
- 44b. Flowers not in catkins—54.
- 45a. Leaf-buds in 2 longitudinal rows on the twigs, so that the third bud is above the first—46.
- 45b. Leaf-buds in 3 or more longitudinal rows—48.
- 46a. Branches bearing numerous short spur-like dwarf branches, thickly covered with leaf-scars and with one terminal bud only (Birch)
1a, in Betulaceae, p. 40.
- 46b. Dwarf branches none, the leaf-scars all scattered on the twigs—47.
- 47a. Bark smooth and gray; trunk fluted longitudinally (Hornbeam)
5a, in Betulaceae, p. 40.
- 47b. Bark flaky and brown; trunk cylindrical, not fluted (Ironwood)
9a, in Betulaceae, p. 41.

- 48a. Leaf-buds tending to be closely clustered at the tips of the twigs (Oak. Identification of oaks from twigs and flowers is not recommended and is not provided for in this book. Young leaves are almost always present at flowering time and can be used for identification) **Fagaceae**, p. 41.
- 48b. Leaf-buds distinctly stalked (European Alder)
8b, in **Betulaceae**, p. 41.
- 48c. Leaf-buds neither stalked nor clustered—49.
- 49a. Pith of the twigs divided transversely into separate chambers
2, in **Juglandaceae**, p. 39.
- 49b. Pith of the twigs solid and continuous—50.
- 50a. Leaf-buds covered by a single visible external bud-scale; twigs very slender and brittle (Willow. Identification of willows by twigs and flowers alone is not practicable)
6, in **Salicaceae**, p. 38.
- 50b. Leaf-buds with 2 or more visible external bud-scales—51.
- 51a. Bundle-traces 3 in each leaf-scar—52.
- 51b. Bundle-traces more than 3 in each leaf-scar (Hickory)
3, in **Juglandaceae**, p. 39.
- 52a. Twigs green or greenish; introduced trees found only along roadsides and near houses (White Poplar)
4a, in **Salicaceae**, p. 38.
- 52b. Twigs reddish-brown; native trees of woods, fields, and swamps—53.
- 53a. Pith of the twigs orange (Swamp Poplar)
4b, in **Salicaceae**, p. 38.
- 53b. Pith of the twigs white (Aspen)
3, in **Salicaceae**, p. 37.
- 54a. Each individual flower less than 8 mm. wide; petals none, or minute and yellowish, reddish, or green—55.
- 54b. Each individual flower more than 15 mm. wide, with 5 conspicuous white petals—56.
- 54c. Each individual flower about 15 mm. wide, with 4 yellow petals, appearing in late autumn (Witch Hazel)
1a, in **Hamamelidaceae**, p. 72.
- 55a. Leaf-buds and leaf-scars opposite (Maple)—57.
- 55b. Leaf-buds and leaf-scars alternate (Elm)
5, in **Urticaceae**, p. 44.
- 56a. Flowers in small umbels; petals obovate or elliptic; style 1 (Wild Plum)
14a, in **Rosaceae**, p. 74.

- 56b. Flowers in racemes; petals linear or narrowly oblong; styles
5 (Juneberry) 26a, in Rosaceae, p. 75.
- 57a. Flowers in almost sessile umbel-like clusters
4, in Aceraceae, p. 93.
- 57b. Flowers in drooping clusters, on long stalks
1c, in Aceraceae, p. 93.
- 58a. Leaves needle-like, awl-shaped, linear, or scale-like, mostly
evergreen Pinaceae, p. 8.
- 58b. Leaves flat and more than 5 mm. wide, mostly falling in
autumn—59.
- 59a. Leaves opposite or whorled—60.
- 59b. Leaves alternate—61.
- 60a. Leaves compound—62.
- 60b. Leaves simple—63.
- 61a. Leaves compound—65.
- 61b. Leaves simple—70.
- 62a. Flowers on slender stalks, in loose drooping clusters (Box
Elder) 1c, in Aceraceae, p. 93.
- 62b. Flowers sessile or nearly so, in dense axillary clusters,
(Ash) Oleaceae, p. 114.
- 63a. Individual flowers small, reddish, yellowish, or green, the petals
inconspicuous or none; leaves lobed (Maple)
1a and 1b, in Aceraceae, p. 92.
- 63b. Individual flowers small and yellow, closely crowded in a dense
head and subtended by 4 large, white, conspicuous, petal-
like bracts; leaves entire (Flowering Dogwood)
3a, in Cornaceae, p. 108.
- 63c. Individual flowers regular, with 5 white petals, numerous in a
branched cluster; leaves toothed
21, in Caprifoliaceae, p. 145.
- 63d. Individual flowers large and irregular, the petals united into
a tubular or bell-shaped corolla; leaves entire—64.
- 64a. Flowers blue-violet (Empress Tree)
4c, in Scrophulariaceae, p. 134.
- 64b. Flowers white or bluish, spotted with yellow and purple within
(Catalpa) 1b, in Bignoniaceae, p. 140.
- 65a. Flowers in catkins Juglandaceae, p. 39.
- 65b. Flowers not in catkins—66.

- 66a. Flowers bright white, with conspicuous petals—67.
- 66b. Flowers greenish or yellowish, with small petals, individually inconspicuous, but often in large conspicuous clusters—68.
- 67a. Flowers irregular, in racemes; leaflets entire (Black Locust)
4a, in *Leguminosae*, p. 78.
- 67b. Flowers regular, in large branched clusters; leaflets toothed (Mountain Ash)
2a, in *Rosaceae*, p. 72.
- 68a. Flowers in axillary spike-like racemes; stems thorny (Honey Locust)
2d, in *Leguminosae*, p. 78.
- 68b. Flowers in terminal panicles; stems not thorny—69.
- 69a. Leaflets toothed throughout their length (Sumach)
4b, in *Anacardiaceae*, p. 91.
- 69b. Leaflets entire except for a few large gland-bearing teeth near their base (Tree of Heaven)
Simarubaceae, p. 87.
- 70a. Flowers individually small or minute; without colored petals or petal-like parts, but sometimes aggregated into conspicuous clusters or heads—71.
- 70b. Flowers individually conspicuous, with colored petals or petal-like parts—81.
- 71a. Juice milky (best seen at the base of a broken leaf-stalk)—72.
- 71b. Juice not milky—73.
- 72a. Leaves toothed or lobed; stems not thorny (Mulberry)
3, in *Urticaceae*, p. 44.
- 72b. Leaves entire; stems thorny (Osage Orange)
2c, in *Urticaceae*, p. 44.
- 73a. Flowers (at least the staminate ones) in slender catkins—74.
- 73b. Flowers not in catkins—78.
- 74a. Lateral veins of the leaves running straight and parallel from midrib to margin—75.
- 74b. Lateral veins crooked, or branched, at least not straight and parallel—77.
- 75a. Leaves in 2 longitudinal rows on the twigs, so that the third leaf is directly above the first—46.
- 75b. Leaves in 3 or more longitudinal rows—76.
- 76a. Leaves very sharply and doubly toothed (European Alder)
8b, in *Betulaceae*, p. 41.
- 76b. Leaves simply toothed, the teeth rarely less than 5 mm. apart
1b, in *Fagaceae*, p. 41.

- 77a. Leaves entire (Willow Oak) 1a, in *Fagaceae*, p. 41.
 77b. Leaves finely toothed, with 4 or more teeth per centimeter of margin (Willow) 6, in *Salicaceae*, p. 38.
 77c. Leaves coarsely toothed or lobed (Oak) 1c and 1d, in *Fagaceae*, p. 41.
 78a. Leaves entire (Black Gum) 2b, in *Cornaceae*, p. 108.
 78b. Leaves toothed—79.
 78c. Leaves lobed—80.
 79a. Leaves thick and leathery, evergreen, spiny on the margin (Holly) 1a, in *Aquifoliaceae*, p. 92.
 79b. Leaves thin in texture, falling in autumn, not spiny on the margin—80.
 80a. Leaves nearly or quite symmetrical and equilateral at base (Buckthorn) 3b, in *Rhamnaceae*, p. 94.
 80b. Leaves very unsymmetrical at base (Hackberry) 4b, in *Urticaceae*, p. 44.
 81a. Flowers white to rose-color, with 4 or 5 petals or 4 or 5 lobes of the corolla—82.
 81b. Flowers yellow, yellowish, or greenish in general color—84.
 82a. Flowers in clusters arising from the midvein of a narrowly oblong leaf-like bract; leaves broadly heart-shaped (Basswood) 11a, in *Tiliaceae*, p. 95.
 82b. Flowers not springing from the center of a leaf-like bract—83.
 83a. Stamens numerous; petals 5, separate from each other 10, in *Rosaceae*, p. 73.
 83b. Stamens 10 (rarely fewer); petals 5, united (*Rhododendron*) 19a, in *Ericaceae*, p. 111.
 83c. Stamens 4; petals 4 (*Dogwood*) 2a, in *Cornaceae*, p. 108.
 84a. Leaves entire—85.
 84b. Leaves toothed—86.
 84c. Leaves lobed—88.
 85a. Flowers with 4 petals, almost sessile on the twigs (*Perimmon*) *Ebenaceae*, p. 114.
 85b. Flowers with 6 petals, in loose clusters (*Sassafras*) 1b, in *Lauraceae*, p. 62.
 86a. Flowers in autumn, with 4 yellow petals (*Witch Hazel*) 1a, in *Hamamelidaceae*, p. 72.
 86b. Flowers in spring or summer, greenish—87.

- 87a. Leaves thick and evergreen, spiny on the margin (Holly)
1a, in Aquifoliaceae, p. 92.
- 87b. Leaves thinner in texture, deciduous, not spiny on the margin
(Buckthorn) 3b, in Rhamnaceae, p. 94.
- 88a. Each flower about 5 cm. wide (Tulip Tree)
1b, in Magnoliaceae, p. 61.
- 88b. Each flower less than 1 cm. wide (Sassafras)
1b, in Lauraceae, p. 62.
- 89a. Fruit a dry capsule or pod, eventually breaking open to discharge the 2 or more seeds which it contains—90.
- 89b. Fruit a hard-shelled nut, wholly or partly surrounded by a husk—95.
- 89c. Fruit (not the seed) flat and winged—99.
- 89d. Fruit a dense spherical head—103.
- 89e. Fruit a cone-like structure—105.
- 89f. Fruit more or less fleshy or berry-like, sometimes hard and dry, but then resembling a fleshy fruit in external appearance at least—110.
- 90a. Seeds with a tuft of cottony hairs Salicaceae, p. 37.
- 90b. Seeds more than an inch long, with a flat wing at each end
(Catalpa) 1b, in Bignoniaceae, p. 140.
- 90c. Seeds without conspicuous hairs or wings—91.
- 91a. Fruit with several capsules closely united into a spherical head
(Sweet Gum) 1b, in Hamamelidaceae, p. 72.
- 91b. Fruits separate, not closely united into a head—92.
- 92a. Fruit a flat elongate pod, with a single row of seeds—93.
- 92b. Fruit a capsule, not flat.—94.
- 93a. Pods 15 mm. wide or less (Black Locust)
4a, in Leguminosae, p. 78.
- 93b. Pods 25 mm. wide or more (Honey Locust)
2d, in Leguminosae, p. 78.
- 94a. Capsule 2-celled, with 2 hard black seeds (Witch Hazel)
1a, in Hamamelidaceae, p. 72.
- 94b. Capsule 2-celled, with very many minute seeds (Empress Tree)
4c, in Scrophulariaceae, p. 134.
- 94c. Capsule 5-celled, with very many minute seeds (Rhododendron)
19a, in Ericaceae, p. 111.
- 95a. Husk only partly covering the nut at its base (an acorn) (Oak)
Fagaceae, p. 41.

- 95b. Husk covering the nut completely—96.
- 96a. Husk with stiff or soft prickles—97.
- 96b. Husk hairy or smooth, but not prickly—98.
- 97a. Nut rounded (Chestnut) 3b, in Fagaceae, p. 43.
- 97b. Nut 3-cornered (Beech) 2a, in Fagaceae, p. 43.
- 98a. Husk breaking lengthwise into 4 parts at maturity (Hickory) 1b, in Juglandaceae, p. 39.
- 98b. Husk not breaking lengthwise (Walnut, Butternut) 1a, in Juglandaceae, p. 39.
- 99a. Fruit on a stiff erect axis, forming a cone-like spike (Tulip Tree) 1b, in Magnoliaceae, p. 61.
- 99b. Fruits in loose open clusters—100.
- 99c. Fruits in a close bunch, more or less cone-like in shape, the wing 3-lobed with a seed at its base (Hornbeam) 5a, in Betulaceae, p. 40.
- 100a. Fruits nearly or quite circular and flat (Elm) 5, in Urticaceae, p. 44.
- 100b. Fruits elongate, the wing or wings at the end—101.
- 100c. Fruit an elongate leaf-like structure, bearing from the middle a cluster of hard black berries (Basswood) Tiliaceae, p. 95.
- 101a. Seed at the center of the fruit (Tree or Heaven) Simarubaceae, p. 87.
- 101b. Seed at the base of the fruit—102.
- 102a. Fruits in pairs attached together at the base, each wing very unsymmetrical (Maple) Aceraceae, p. 92.
- 102b. Fruits not united in pairs, the wing symmetrical (Ash) Oleaceae, p. 114.
- 103a. Head about 25 mm. in diameter, on a slender stalk 6-10 cm. long—104.
- 103b. Head 5-8 cm. in diameter, with milky juice, on a very short stalk (Osage Orange) 2c, in Urticaceae, p. 44.
- 104a. Head prickly, not hairy (Sweet Gum) 1b, in Hamamelidaceae, p. 72.
- 104b. Head not prickly, eventually breaking into cottony individual parts (Sycamore) Platanaceae, p. 72.
- 105a. With evergreen, needle-like, awl-shaped, or scale-like leaves Pinaceae, p. 8.

- 105b. With leaves more than 5 mm. broad during the summer, or without leaves during the winter—106.
- 106a. The scales of the cone hard and woody in texture—107.
- 106b. The scales of the cone membranous or papery in texture—108.
- 107a. Cones in small clusters (European Alder)
8b, in *Betulaceae*, p. 41.
- 107b. Cones solitary (Tamarack)
1a, in *Pinaceae*, p. 8.
- 108a. Cone-scales sack-like, enclosing the seed (Ironwood)
9a, in *Betulaceae*, p. 41.
- 108b. Cone-scales open or flat, bearing the seed-like fruit on the surface at the base—109.
- 109a. Cone-scales about 20–25 mm. long (Hornbeam)
5a, in *Betulaceae*, p. 40.
- 109b. Cone-scales 10 mm. long or less (Birch)
1a, in *Betulaceae*, p. 40.
- 110a. Leaves evergreen, awl-shaped, not more than 2 mm. wide (Red Cedar, Juniper)
7, in *Pinaceae*, p. 9.
- 110b. Leaves at least 1 cm. wide, or absent during the winter—111.
- 111a. Fruit resembling a blackberry, with numerous small juicy parts (Mulberry)
3, in *Urticaceae*, p. 44.
- 111b. Fruits hard and black, in a small cluster attached to the middle of an oblong leaf-like bract (Basswood)
Tiliaceae, p. 95.
- 111c. Fruits not resembling a blackberry and not attached to the middle of a bract—112.
- 112a. Each separate fruit 1-seeded—113.
- 112b. Each separate fruit with 2 or more seeds—118.
- 113a. Fruits red when ripe—114.
- 113b. Fruits black when ripe—117.
- 114a. Fruits in large pyramidal clusters, each berry hairy (Sumach)
4b, in *Anacardiaceae*, p. 91.
- 114b. Fruits in small head-like clusters; leaves or leaf-scars opposite (Flowering Dogwood)
3a, in *Cornaceae*, p. 108.
- 114c. Fruits in loose open clusters, smooth; leaves or leaf-scars alternate—115.
- 115a. Fruits very spicy, aromatic in taste (Sassafras)
1b, in *Lauraceae*, p. 62.
- 115b. Fruits acid in taste, not spicy—116.

- 116a. Seed flattened (Wild Plum) 14a, in Rosaceae, p. 74.
 116b. Seed round or nearly so (Cherry) 15, in Rosaceae, p. 74.
 117a. Fruits in flattened or rounded clusters; leaves or leaf-scars
 opposite 21, in Caprifoliaceae, p. 145.
 117b. Fruits in slender racemes; leaf-scars or leaves alternate (Cherry)
 11a, in Rosaceae, p. 74.
 117c. Fruits solitary (Hackberry) 4b, in Urticaceae, p. 44.
 117d. Fruits in small heads of 2-8 (Sour Gum)
 2b, in Cornaceae, p. 108.
 118a. Fruits bright red, dull red, or green when ripe—119.
 118b. Fruits yellow when fully ripe; seeds 4 (Persimmon)
 Ebenaceae, p. 114.
 118c. Fruits black or dark purple when ripe—121.
 119a. Fruit tipped with the remains of the calyx; leaves not thorny
 on the margin—120.
 119b. Fruit not tipped with a calyx; leaves spiny on the margin
 (Holly) 1a, in Aquifoliaceae, p. 92.
 120a. Fruits about 5 mm. in diameter, in large rounded clusters
 (Mountain Ash) 2a, in Rosaceae, p. 72.
 120b. Fruits 10-30 mm. in diameter; stems thorny (Hawthorn)
 22c, in Rosaceae, p. 75.
 120c. Fruits 40-75 mm. in diameter (Apple)
 22a, in Rosaceae, p. 75.
 121a. Fruits tipped with the remains of the calyx, 10-seeded (if all
 ripen) (Juneberry) 26a, in Rosaceae, p. 75.
 121b. Fruits not tipped with a calyx, with 3 or 4 seeds (Buckthorn)
 3b, in Rhamnaceae, p. 94.
 122a. Key for use with shrubs which have flowers but no leaves
 —123.
 122b. Key for use with shrubs bearing both flowers and leaves
 —139.
 123a. Flowers in catkins, without petals or petal-like parts—124.
 123b. Flowers not in catkins, with visible petals or petal-like parts
 —131.
 124a. Leaves 2-ranked, as shown by the arrangement of leaf-buds
 and leaf-scars in 2 longitudinal rows, so that the third bud
 or scar is directly over the first—125.
 124b. Leaf-buds and leaf-scars in 3 or more longitudinal rows
 —127.

- 125a. Leaf-buds with only 1-3 visible bud-scales; pistillate flowers with scarlet styles just protruding from a bud; 1-2 m. high, usually with several stems from the ground (Hazel)
10, in *Betulaceae*, p. 41.
- 125b. Leaf-buds with more than 3 visible bud-scales; pistillate flowers in catkin-like clusters; tall shrubs, often with a single trunk—126.
- 126a. Bark of the trunk smooth and dark gray, fluted with longitudinal ridges (Hornbeam) 5a, in *Betulaceae*, p. 40.
- 126b. Bark of the trunk brownish gray, flaky, without projecting ridges (Ironwood) 9a, in *Betulaceae*, p. 41.
- 127a. Pith 3-angled; leaf-buds on short stalks (Alder)
7, in *Betulaceae*, p. 41.
- 127b. Pith 5-angled; leaf-buds not stalked, usually crowded toward the tips of the twigs (Oak). The two species of shrubby Oaks are best distinguished by their leaves, which may usually be found on the ground under the plants, or the young leaves may be sufficiently expanded for examination—172.
- 127c. Pith cylindrical; buds neither stalked nor clustered—128.
- 128a. Leaf-buds with 1 visible external scale; twigs elongate and generally straight, smooth, and slender; staminate catkins solitary from each bud (Willow). The several species can not be well distinguished by their flowers alone.
9, in *Salicaceae*, p. 38.
- 128b. Leaf-buds with 2 or more visible outer scales; twigs freely branched, usually stiff and crooked; staminate catkins in clusters—129.
- 129a. Shrub of bogs and wet grounds (Sweet Gale)
2b, in *Myricaceae*, p. 39.
- 129b. Shrubs of dry upland hills and woods—130.
- 130a. Staminate and pistillate catkins ovoid (Bayberry)
2a, in *Myricaceae*, p. 39.
- 130b. Staminate catkins slender; pistillate catkins globular (Sweet Fern)
1a, in *Myricaceae*, p. 39.
- 131a. Flowers in autumn, after the leaves have fallen, yellow, with 4 petals (Witch Hazel) 1a, in *Hamamelidaceae*, p. 72.
- 131b. Flowers in spring, before the leaves have unfolded—132.

- 132a. Flowers 5 mm. wide or less, yellowish, greenish, or white
—133.
- 132b. Flowers 10 mm. wide or more, white to pink or purple—136.
- 133a. Twigs thorny (Prickly Ash) 1a, in Rutaceae, p. 87.
- 133b. Twigs without thorns—134.
- 134a. Bark pleasantly aromatic when crushed; flowers yellow with
6 petals Lauraceae, p. 62.
- 134b. Bark not aromatic when crushed—135.
- 135a. Flowers yellowish (Leatherwood) Thymelaeaceae, p. 101.
- 135b. Flowers pink or white (Blueberry) 30, in Ericaceae, p. 113.
- 136a. Stamens 5; petals united at base, all about equal in size
(Wild Honeysuckle) 21a, in Ericaceae, p. 111.
- 136b. Stamens 10; petals partly united, the 2 lower separate
nearly to their base, the 3 upper almost completely united
(Rhodora) 20a, in Ericaceae, p. 111.
- 136c. Stamens 15 or more; petals all alike and completely sep-
arate—137.
- 137a. Flowers in racemes (Juneberry) 26, in Rosaceae, p. 75.
- 137b. Flowers in sessile lateral umbels—138.
- 138a. Petals 10–16 mm. long; branches more or less thorny (Wild
Plum) 14a, in Rosaceae, p. 74.
- 138b. Petals 4–6 mm. long; branches never thorny
16, in Rosaceae, p. 74.
- 139a. Leaves none, or reduced to small scales only; stem thick, fleshy,
jointed; flowers large and yellow (Prickly Pear)
Cactaceae, p. 101.
- 139b. Leaves long and needle-like, evergreen, in bundles of 3 sur-
rounded by a short sheath at base; fruit a cone (Pitch
Pine) 3c, in Pinaceae, p. 9.
- 139c. Leaves narrowly lanceolate or awl-shaped or awl-pointed, ever-
green, less than 2 cm. long, densely crowded or often over-
lapping—140.
- 139d. Leaves of a broader type, not especially crowded or overlapping,
flat or with the sides rolled under—142.
- 140a. Flowers conspicuous, with 5 white to pink petals; prostrate
plant of the Pine Barrens (Pyxie) Diapensiaceae, p. 113.
- 140b. Flowers conspicuous, bright yellow, with 5 petals (False
Heather) 2a, in Cistaceae, p. 98.
- 140c. Flowers minute, but with conspicuous purple filaments; petals

- none (Broom Crowberry) *Empetraceae*, p. 91.
- 140d. Flowers inconspicuous, in small catkins, without petals—141.
- 141a. Leaves, when carefully examined, opposite or whorled (Juniper, Cedar) 7, in *Pinaceae*, p. 9.
- 141b. Leaves alternate, arranged in approximately 2 rows on opposite sides of the twig (Ground Hemlock) *Taxaceae*, p. 8.
- 142a. Leaves opposite or whorled—143.
- 142b. Leaves alternate or scattered—158.
- 143a. Leaves compound—144.
- 143b. Leaves simple—146.
- 144a. Leaflets 3; flowers white (Bladdernut) *Staphyleaceae*, p. 92.
- 144b. Leaflets 5 or more—145.
- 145a. Flowers orange-red, 6 cm. long (Trumpet Creeper) 1a, in *Bignoniaceae*, p. 140.
- 145b. Flowers white, 3-4 mm. wide (Elder) 2, in *Caprifoliaceae*, p. 144.
- 146a. Leaves palmately lobed—147.
- 146b. Leaves toothed or entire—148.
- 147a. Flowers yellow or greenish yellow, in racemes 5, in *Aceraceae*, p. 93.
- 147b. Flowers white, in rounded or flattened terminal clusters 15, in *Caprifoliaceae*, p. 145.
- 148a. Flowers individually small, white, crowded in dense spherical heads (Button Bush) 1a, in *Rubiaceae*, p. 141.
- 148b. Flowers individually small, yellow or greenish, but subtended by 4 large white petal-like bracts (Flowering Dogwood) 3a, in *Cornaceae*, p. 108.
- 148c. Flowers neither in dense round heads nor subtended by large petal-like bracts—149.
- 149a. Petals plainly and visibly united with each other—150.
- 149b. Petals plainly separate from each other, or too small to observe clearly—152.
- 150a. Stamens 10—151.
- 150b. Stamens 4 or 5 3c and 3d, in *Caprifoliaceae*, p. 144.
- 151a. Flowers pink to white, 2-3 cm. wide (Mountain Laurel) 18a, in *Ericaceae*, p. 111.
- 151b. Flowers purple or crimson, less than 2 cm. wide 17, in *Ericaceae*, p. 110.

- 152a. Petals yellow; stamens more than 10—153.
 152b. Petals not yellow—154.
- 153a. Petals 4 2, in *Hypericaceae*, p. 96.
 153b. Petals 5 (St. John's-wort) 7a, in *Hypericaceae*, p. 96.
- 154a. Leaves toothed—155.
 154b. Leaves entire—156.
- 155a. Flowers purple-red or greenish purple; stamens 4 or 5
 2, in *Celastraceae*, p. 92.
 155b. Flowers white; stamens 8 or more 12, in *Saxifragaceae*, p. 72.
- 156a. Leaves whorled; flowers pale purple, in dense axillary clusters
 (Swamp Loosestrife) 5a, in *Lythraceae*, p. 101.
 156b. Leaves opposite; flowers in loose or dense terminal clusters
 —157.
- 157a. Petals 5; leaves less than 2 cm. long (Sand Myrtle)
 10a, in *Ericaceae*, p. 110.
 157b. Petals 4; leaves more than 3 cm. long (Dogwood)
 3b, in *Cornaceae*, p. 108.
- 158a. Leaves compound—159.
 158b. Leaves simple—163.
- 159a. Leaves twice or thrice compound; stem thorny (Hercules' Club)
 3a, in *Araliaceae*, p. 105.
 159b. Leaves only once compound, either pinnately or palmately
 —160.
- 160a. Flowers bright yellow, conspicuous—161.
 160b. Flowers brightly white to pink, conspicuous—162.
 160c. Flowers dark blue, in long spikes (False Indigo)
 2b, in *Leguminosae*, p. 78.
- 160d. Flowers greenish or yellowish, each individual flower small
 and inconspicuous, but often numerous and crowded in large
 clusters—163.
- 161a. Leaflets 3; flowers irregular (Scotch Broom)
 3b, in *Leguminosae*, p. 78.
 161b. Leaflets 5-7; flowers regular (Cinquefoil)
 3a, in *Rosaceae*, p. 73.
- 162a. Flowers irregular, with 10 concealed stamens (Locust)
 4, in *Leguminosae*, p. 78.
 162b. Flowers regular, with more than 10 protruding stamens
 3b and 3c, in *Rosaceae*, p. 73.
- 163a. Leaves pinnately compound with 5 to many leaflets—164.

- 163b. Leaves palmately compound with 5 leaflets (Virginia Creeper)
1a, in Vitaceae, p. 94.
- 163c. Leaves with 3 leaflets—167.
- 164a. Stems thorny (Prickly Ash) 1a, in Rutaceae, p. 87.
- 164b. Stems not thorny—165.
- 165a. Leaflets entire (very poisonous to the touch) (Poison Sumach)
2a, in Anacardiaceae, p. 91.
- 165b. Leaflets toothed—166.
- 166a. Juice milky (best seen at the end of a broken leaf-stalk)
(Sumach) 2b, in Anacardiaceae, p. 91.
- 166b. Juice not milky (Tree of Heaven) Simarubaceae, p. 87.
- 167a. Stalk of the terminal leaflet much longer than those of the
lateral ones (poisonous to the touch) (Poison Ivy)
1a, in Anacardiaceae, p. 91.
- 167b. Stalks of all 3 leaflets very short and approximately equal
(Hop Tree) 1b, in Rutaceae, p. 87.
- 168a. Blooming in spring or early summer—170.
- 168b. Blooming in late summer or autumn—169.
- 169a. Woodland shrub with yellow flowers in axillary clusters (Witch
Hazel) 1a, in Hamamelidaceae, p. 72.
- 169b. Salt-marsh shrub with large terminal panicles or white or yellowish
flowers (Groundsel Tree) 66a, in Compositae, p. 158.
- 170a. Flowers in catkins or catkin-like clusters, without petals
—171.
- 170b. Flowers not in catkins, either with or without petals or
other colored parts—173.
- 171a. Leaves very coarsely toothed or lobed, each separate tooth or
lobe one centimeter wide or more (Scrub Oak)—172.
- 171b. Leaves finely and sometimes doubly toothed, each separate tooth
less than 5 mm. wide—124.
- 172a. Each tooth of the leaves blunt at the end
5b, in Fagaceae, p. 43.
- 172b. Each tooth acute and tipped with a short bristle
11a, in Fagaceae, p. 44.
- 173a. Climbing vines—174.
- 173b. Erect or ascending or trailing shrubs—177.
- 174a. Climbing by means of tendrils—175.

- 174b. Twining vines—176.
- 174c. Merely reclining on fences, or bushes, or other supports
(Matrimony Vine) 1a, in *Solanaceae*, p. 131.
- 175a. Leaves entire (Green Brier) 2b, in *Liliaceae*, p. 27.
- 175b. Leaves toothed or lobed (Grape) 1b, in *Vitaceae*, p. 94.
- 176a. Leaves peltate, the petiole attached to the back of the blade
near its margin (Moonseed) *Menispermaceae*, p. 61.
- 176b. Petiole attached to the actual base of the blade (Bitter-
sweet) 1a, in *Celastraceae*, p. 92.
- 177a. Petals or petal-like parts none—178.
- 177b. Petals or petal-like parts 6 or more—180.
- 177c. Petals or petal-like parts 4 or 5—182.
- 178a. Leaves linear, very short; filaments purple and conspicuous
(Broom Crowberry) *Empetraceae*, p. 91.
- 178b. Leaves ovate to elliptic or oblong—179.
- 179a. Juice milky; stems thorny (Osage Orange)
2c, in *Urticaceae*, p. 44.
- 179b. Juice not milky; thorns few and blunt, or none (Buckthorn)
1b, in *Rhamnaceae*, p. 94.
- 180a. Flowers white, 5-7 cm. wide; stamens many (Sweet Bay)
1a, in *Magnoliaceae*, p. 61.
- 180b. Flowers yellow, less than 1 cm. wide—181.
- 181a. Leaves entire or with entire lobes, aromatic when crushed;
thorns none (Sassafras) 1b, in *Lauraceae*, p. 62.
- 181b. Leaves finely toothed, not aromatic; stems thorny (Barberry)
1a, in *Berberidaceae*, p. 62.
- 182a. Flowers irregular, bright yellow (Greenweed)
3a, in *Leguminosae*, p. 78.
- 182b. Flowers regular—183.
- 183a. Petals or petal-like parts separate from each other—184.
- 183b. Petals or petal-like parts united with each other, at least near
the base—193.
- 184a. Stamens more than 10 and in plain sight, more or less
protruding from the flower—185.
- 184b. Stamens 8 or 10, just twice as many as the petals or corolla-
lobes, and often concealed within the corolla—186.
- 184c. Stamen just as many as the petals and in plain sight, or
none—187.
- 185a. Petals white or pink or purple 10, in *Rosaceae*, p. 73.

- 185b. Petals bright yellow (False Heather) 2a, in *Cistaceae*, p. 98.
 186a. Petals 4 (Cranberry) 8a, in *Ericaceae*, p. 109.
 186b. Petals 5 10, in *Ericaceae*, p. 110.
 187a. Flowers in conspicuous terminal clusters—188.
 187b. Flowers inconspicuous, in small axillary clusters—190.
 188a. Flowers in flattened clusters; petals 4; leaves entire (Dogwood) 2a, in *Cornaceae*, p. 108.
 188b. Flowers in pyramidal panicles; petals 5; leaves toothed (New Jersey Tea) 1a, in *Rhamnaceae*, p. 94.
 188c. Flowers in racemes—189.
 189a. Leaves narrowly oblong, pointed (Virginia Willow) 7b, in *Saxifragaceae*, p. 71.
 189b. Leaves round or nearly round, palmately lobed and veined (Currant) 8a, in *Saxifragaceae*, p. 71.
 190a. Leaves round or nearly so, palmately lobed and veined (Gooseberry) 8b, in *Saxifragaceae*, p. 71.
 190b. Leaves oblong, ovate, obovate, or elliptical, pinnately veined—191.
 191a. With a stamen in front of each petal (Buckthorn) 1b, in *Rhamnaceae*, p. 94.
 191b. With a stamen between each two petals *Aquifoliaceae*, p. 91.
 191c. If no stamens can be found in any of the flowers—192.
 192a. Stigma one, sessile or nearly so on the ovary *Aquifoliaceae*, p. 91.
 192b. Stigmas 3 or 4, at the top of the short style (Buckthorn) 1b, in *Rhamnaceae*, p. 94.
 193a. Stamens just as many as the sepals or petals, and in plain sight—194.
 193b. Stamens twice as many as the sepals or petals, and often concealed within the corolla—196.
 194a. Leaves nearly round, palmately lobed and veined (Gooseberry, Currant) 7a, in *Saxifragaceae*, p. 71.
 194b. Leaves narrower in shape, entire—195.
 195a. Flowers about 1 cm. wide, greenish or purple (Matrimony Vine) 1a, in *Solanaceae*, p. 131.
 195b. Flowers 2.5–5 cm. wide, white, pink or rose 18b, in *Ericaceae*, p. 111.
 196a. Both calyx and corolla plainly present 13, in *Ericaceae*, p. 110.

- 196b. Perianth consisting of a petal-like calyx only which is funnel-form, yellow, and somewhat 4-lobed (Leatherwood)

Thymelaeaceae, p. 101.

II. Aquatic Plants

Note: Only plants with floating or submerged leaves and flowers can be identified here.

- 1a. Submerged aquatic, without leaves, consisting of a flower-stalk only, usually with scales upon it—2.
- 1b. Submerged aquatics, the leaves linear or lanceolate, neither lobed nor dissected—3.
- 1c. Submerged aquatics, the leaves deeply lobed, dissected, or compound—16.
- 1d. Floating aquatics, all or most of the leaves or the whole plant on the surface of the water—22.
- 2a. Flowers conspicuous, with a yellow or purple irregular corolla
5, in *Lentibulariaceae*, p. 139.
- 2b. Flowers minute and inconspicuous, purplish or greenish, in a terminal interrupted spike 1a, in *Haloragidaceae*, p. 104.
- 3a. Leaves all basal—4.
- 3b. Stem-leaves present—7.
- 4a. Flowers blue, 1 cm. long or more; leaves cylindrical, blunt, hollow, divided lengthwise into separate cavities
1a, in *Lobeliaceae*, p. 147.
- 4b. Flowers yellow, irregular; leaves minute
5, in *Lentibulariaceae*, p. 139.
- 4c. Flowers whitish or lead-color, small, in dense heads; leaves linear, grass-like *Eriocaulaceae*, p. 24.
- 4d. Flowers small and greenish, solitary at the end of elongate spiral peduncles; leaves linear, very long and ribbon-like
1a, in *Hydrocharitaceae*, p. 13.
- 4e. Flowers white or purplish, not in dense heads—5.
- 4f. Flowers none; leaves short, linear
3, in *Ferns and their Allies*, p. 1.
- 5a. Flowers solitary at the end of unbranched stalks
4a, in *Scrophulariaceae*, p. 133.
- 5b. Flowers in clusters—6.
- 6a. Flowers in umbels or racemes; petals 3; leaves flat or nearly so
Alismaceae, p. 11.

- 6b. Flowers in umbels; petals 5; leaves cylindrical and hollow
2a, in Umbelliferae, p. 105.
- 7a. Flowers with 3 small but conspicuous white, pale blue or yellow petals
2, in Pontederiaceae, p. 25.
- 7b. Flowers minute and inconspicuous, although sometimes aggregated into conspicuous clusters; petals none or greenish—8.
- 8a. Leaves alternate—9.
- 8b. Leaves opposite—12.
- 8c. Leaves whorled—15.
- 9a. In salt or brackish water
4, in Naiadaceae, p. 10.
- 9b. In fresh water—10.
- 10a. Leaves with thin sheathing stipules
6, in Naiadaceae, p. 10.
- 10b. Leaves without stipules—11.
- 11a. Leaf-blades less than 3 cm. long
4, in Haloragidaceae, p. 104.
- 11b. Leaf-blades long and slender, grass-like
Sparganiaceae, p. 10.
- 12a. Flowers in stalked spikes or heads
6, in Naiadaceae, p. 10.
- 12b. Flowers axillary—13.
- 13a. Leaves minutely toothed, 2-3 cm. long, abruptly widened at base—15a.
- 13b. Leaves entire—14.
- 14a. Leaves thread-like, 2-8 cm. long
2a, in Naiadaceae, p. 10.
- 14b. Leaves mostly less than 2 cm. long
Callitrichaceae, p. 90.
- 15a. Leaves minutely toothed, 2-3 cm. long, abruptly widened at base
5, in Naiadaceae, p. 10.
- 15b. Leaves strictly entire
1b, in Hydrocharitaceae, p. 13.
- 16a. Corollas none or very small; flowers greenish—17.
- 16b. Corollas conspicuous, white—19.
- 16c. Corollas conspicuous, yellow or purple—21.
- 17a. Leaves alternate
Podostemaceae, p. 70.
- 17b. Leaves opposite—18.
- 18a. Leaves pinnately divided or compound
Haloragidaceae, p. 104.
- 18b. Leaves palmately divided or compound
Ceratophyllaceae, p. 56.
- 19a. Petals 4
26a, in Cruciferae, p. 66.
- 19b. Petals 5 or rarely more—20.
- 20a. Leaves all basal; flower-stalks greatly inflated
1a, in Primulaceae, p. 113.

- 20b. Leaves alternate on the stem; flower-stalks slender
3, in Ranunculaceae, p. 57.
- 21a. Flowers irregular, with a spur 1a, in Lentibulariaceae, p. 139.
- 21b. Flowers regular, with 5 petals, not spurred; leaves alternate
2a, in Ranunculaceae, p. 57.
- 21c. Flower-heads regular, 3-4 cm. wide with 6-10 petal-like
rays; leaves opposite 111a, in Compositae, p. 163.
- 22a. Plants floating free on the surface and not attached to the
soil—23.
- 22b. Plants attached to the soil—24.
- 23a. Plant consisting of a floating stem bearing numerous roots
and leaves 2, in Ferns and their Allies, p. 1.
- 23b. Plant consisting of flat or ellipsoid bodies, sometimes attached
to each other and bearing 1-3 roots or none at all
Lemnaceae, p. 23.
- 24a. Leaves compound or deeply divided 26a, in Cruciferae, p. 66.
- 24b. Leaves attached to their stalks at their center—25.
- 24c. Leaves heart-shaped, with a cluster of slender tubers at the
base of the blade 1a, in Gentianaceae, p. 115.
- 24d. Leaves very long and grass-like—26.
- 24e. Leaves with none of the above characters—27.
- 25a. Flowers 1 cm. in diameter, or much more Nymphaeaceae, p. 56.
- 25b. Flowers very small, in small umbels 3, in Umbelliferae, p. 105.
- 26a. Flowers in dense panicles Wild Rice, *Zizania aquatica*.
- 26b. Flowers in dense globular heads Sparganiaceae, p. 10.
- 27a. Leaves all basal or arising from a creeping rootstalk—28.
- 27b. Stem-leaves present—30.
- 28a. Individual flowers 3-15 cm. wide, white or yellow; leaves
heart-shaped or round Nymphaeaceae, p. 56.
- 28b. Individual flowers less than 3 cm. wide, and the leaves nar-
rower in shape—29.
- 29a. Flowers minute, yellow, crowded in fleshy spikes 3-5 cm.
long; leaves elliptic 4c, in Araceae, p. 23.
- 29b. Flowers minute, white, in umbels; leaves round, crenate at the
margin 3, in Umbelliferae, p. 105.
- 29c. Flowers white with 3 petals; leaves entire Alismaceae, p. 11.
- 30a. Leaves opposite or whorled; flowers minute and inconspic-
uous—31.
- 30b. Leaves alternate—33.

- 31a. Flowers in short spikes or heads 6, in *Naiadaceae*, p. 10.
 31b. Flowers axillary—32.
 32a. Floating leaves acute, rarely less than 2 cm. long, including the petiole 2a, in *Onagraceae*, p. 102.
 32b. Floating leaves broadly rounded at the end, rarely more than 1 cm. long, including the petiole *Callitrichaceae*, p. 90.
 33a. Leaves round-kidney-shaped; flower with 6 white or pale blue petals 2a, in *Pontederiaceae*, p. 25.
 33b. Leaves oblong or elliptic to linear—34.
 34a. Leaves with a single midvein; flowers in a dense spike, with 5 pink petals 28a, in *Polygonaceae*, p. 48.
 34b. Leaves with several longitudinal veins; flowers inconspicuous, without petals, in spikes or heads 6, in *Naiadaceae*, p. 10.

III. Land Plants of Unusual Habits or Structure

Note: Aquatic plants, and plants with woody stems, or thorns, or milky juice, or stinging hairs, or leaves of odd shape, are not considered here.

- 1a. Plants with normal green color in at least some of their parts—2.
 1b. White, pink, purplish, yellow, or brown plants, without green color in any of their parts, and without leaves, or merely with small scales in place of leaves—4.
 2a. Stem divided into broad and flat, oval, fleshy, thorny joints; leaves reduced to small scales or usually none; flowers large and yellow *Cactaceae*, p. 101.
 2b. Stem not thorny—3.
 3a. Leaves none at flowering-time—9.
 3b. Leaves reduced to small scales—17.
 3c. Leaves very thick and fleshy—20.
 3d. Leaves hollow—25.
 3e. Leaves small, all basal, bearing large glandular sticky hairs on the upper surface or all around; flowers small, in racemes *Droseraceae*, p. 69.

- 4a. Stemless and leafless plant, consisting of flowers only, which are produced at or partly beneath the surface of the ground
4a, in *Araceae*, p. 23.
- 4b. Twining vines, clinging to other plants by holdfast organs, with very slender yellow, orange, or brown stems and small clusters of flowers
1b, in *Convolvulaceae*, p. 119.
- 4c. Plants with erect stems—5.
- 5a. Stem bearing several whorls of numerous erect scales
8a, in *Ferns and their Allies*, p. 2.
- 5b. Stem without scales, or with opposite or alternate scales—6.
- 6a. Corolla regular, its petals or lobes all alike in size and shape—7.
- 6b. Corolla irregular, its petals or lobes more or less unlike in size and shape—8.
- 7a. Stem with alternate scales; stamens 6–10
1a, in *Ericaceae*, p. 109.
- 7b. Stem with opposite scales; stamens 4
1c, in *Gentianaceae*, p. 115.
- 8a. Sepals 3; petals 3, the two upper similar, the lower dissimilar in size and shape
1b, in *Orchidaceae*, p. 33.
- 8b. Sepals 5; petals united, not spurred; stamens 4
Orobanchaceae, p. 139.
- 8c. Sepals united into a 2-lipped calyx; corolla 2-lipped, bright yellow or purple, with a conspicuous spur; stamens 2
Lentibulariaceae, p. 139.
- 9a. Stem with very many branches—10.
- 9b. Stem unbranched below the flower-cluster, or with a very few branches only—11.
- 10a. Flowers lateral, greenish, with 6 parts in the perianth; stem not jointed
9a, in *Liliaceae*, p. 28.
- 10b. True flowers not produced, but a terminal cone-like body produces spores; stem conspicuously jointed
7, in *Ferns and their Allies*, p. 2.
- 11a. Stems conspicuously jointed; true flowers not produced, but a terminal cone-like body produces spores
6, in *Ferns and their Allies*, p. 2.
- 11b. Stem not conspicuously jointed; true flowers produced—12.
- 12a. Flowers greenish or brownish, without obvious colored petals—13.

- 12b. Flowers with white or colored petals—14.
- 13a. Each flower with 6 small chaffy petals 4, in *Juncaceae*, p. 26.
- 13b. Petals none, each minute flower in the axil of a greenish or brownish chaffy bract 2a, in *Cyperaceae*, p. 20.
- 14a. Flowers bright yellow, appearing in early spring, somewhat resembling a dandelion 106a, in *Compositae*, p. 162.
- 14b. Flowers appearing in summer; not the least resembling a dandelion in shape—15.
- 15a. Flowers regular; sepals and petals similar, 6 in all; crushed stem with the odor of onions 14a, in *Liliaceae*, p. 29.
- 15b. Flowers irregular; sepals and petals unlike; odor not of onions—16.
- 16a. Sepals 3, all alike and separate; flowers never bright yellow 1a, in *Orchidaceae*, p. 33.
- 16b. Sepals united into a 2-lipped calyx; flowers frequently bright yellow; corolla with a spur 5, in *Lentibulariaceae*, p. 139.
- 17a. True flowers none, the reproductive organs in terminal cone-like structures 4c, in *Ferns and their Allies*, p. 1.
- 17b. True flowers present at the proper season—18.
- 18a. Flowers minute and greenish, without petal-like parts 1a, in *Chenopodiaceae*, p. 49.
- 18b. Flowers greenish, lateral, with 6 petals 9a, in *Liliaceae*, p. 28.
- 18c. Flowers greenish-yellow, white, or purplish, regular, with a 4-lobed corolla 1c, in *Gentianaceae*, p. 116.
- 18d. Flowers yellow, regular, with 5 petals—19.
- 18e. Flowers bright yellow or purple, very irregular with a spur 5, in *Lentibulariaceae*, p. 139.
- 19a. Scale-leaves numerous and close, overlapping and nearly or quite concealing the stem 3, in *Cistaceae*, p. 98.
- 19b. Scale-leaves opposite, not overlapping and not concealing the stem 10a, in *Hypericaceae*, p. 97.
- 20a. Plants of sea-beaches and salt-marshes—21.
- 20b. Plants of inland situations, usually in dry or cultivated places—24.
- 21a. Leaves on the stem, opposite—22.
- 21b. Leaves on the stem, alternate—23.
- 21c. Leaves linear, in clusters around the base of the 1-flowered

- flower-stalk; plant creeping in the mud
4a, in *Scrophulariaceae*, p. 133.
- 22a*. Leaves oval to broadly ovate, clasping at base
9a, in *Caryophyllaceae*, p. 54.
- 22b*. Leaves linear to narrowly oblong, not clasping
2a, in *Primulaceae*, p. 113.
- 23a*. Leaves 2-4 cm. long; flowers greenish or brownish, with no colored petals
7, in *Chenopodiaceae*, p. 50.
- 23b*. Leaves 4-10 cm. long; flowers purple or purplish, with yellow center
205, in *Compositae*, p. 174.
- 24a*. Whole plant prostrate, with obovate leaves; flowers yellow, axillary
1b, in *Portulacaceae*, p. 56.
- 24b*. Plants ascending or erect
2, in *Crassulaceae*, p. 70.
- 25a*. Leaves pitcher-shaped, open at the top
Sarraceniaceae, p. 69.
- 25b*. Leaves linear or narrow, closed at the top—*26*.
- 26a*. Leaves with a strong odor of garlic; weeds of lawns and meadows
24b, in *Liliaceae*, p. 30.
- 26b*. Leaves without the odor of garlic; aquatic plants of muddy shores—*27*.
- 27a*. Leaves divided lengthwise by a partition inside
1a, in *Lobeliaceae*, p. 147.
- 27b*. Leaves divided crosswise by partitions inside
2a, in *Umbelliferae*, p. 105.

IV. Herbaceous Monocotyledons

- 1a*. Twining plants, with flowers in panicles or racemes
Dioscoreaceae, p. 32.
- 1b*. Plants not twining, although some climb by tendrils—*2*.
- 2a*. Flowers individually small and inconspicuous, but crowded in close spikes or heads which are surrounded by or subtended by one green or white or colored bract, the whole resembling a single flower with one large petal; real petals minute or wanting; leaves broad, neither grass-like nor linear nor sword-shaped
Araceae, p. 23.
- 2b*. Flowers greenish, yellowish, brownish, or dull-colored, never brightly colored or white, and frequently dry or chaffy or scale-like in texture; petals minute or none and never petal-like in color or texture; individual flowers small or incon-

- spicuous, but often grouped into conspicuous clusters; leaves narrow, grass-like, linear, or sword-shaped—3.
- 2c. Flowers always with a white or colored, more or less conspicuous perianth, and never chaffy or scale-like in texture or appearance; leaves of various sorts, from grass-like to broad. In a few cases the flowers are greenish, but then their size, conspicuousness and texture distinguish them from the two groups described above—13.
- 3a. Flowers in the axils of dry or papery or chaffy scale-like bracts, which are regularly arranged into small spikes or spikelets of uniform size and structure; these spikelets variously grouped or clustered; fruit an achene; grasses and sedges, with jointed stems and leaves sheathing at the base, or leafless and the stems not jointed—4.
- 3b. Flowers not subtended individually by dry, papery, or chaffy scales, or otherwise not agreeing with 3a—5.
- 4a. Leaf-sheaths split lengthwise down the side opposite the leaf-blade; leaves usually 2-ranked, forming two longitudinal rows with the third leaf over the first; stems rounded or flat, never triangular, usually hollow **Gramineae**, p. 13.
- 4b. Leaf-sheaths closed into a continuous tube surrounding the stem; leaves usually 3-ranked; stems frequently triangular, usually solid **Cyperaceae**, p. 18.
- 5a. Flowers in dense rounded heads—6.
- 5b. Flowers in branched clusters **Juncaceae**, p. 25.
- 5c. Flowers in spikes or slender spike-like racemes—9.
- 6a. Heads solitary at the end of each stalk **Eriocaulaceae**, p. 24.
- 6b. Heads two or more on each-flower-stalk—7.
- 7a. All heads of flowers in each cluster alike—8.
- 7b. The lowest heads pistillate, the upper smaller and staminate **Sparganiaceae**, p. 10.
- 8a. Leaves either completely smooth or softly hairy **Juncaceae**, p. 25.
- 8b. Leaves bristly or spiny along the margin 4a, in **Umbelliferae**, p. 105.
- 9a. Spike or raceme terminal on its stalk—10.
- 9b. Spike apparently lateral near the summit of the stem 3a, in **Araceae**, p. 23.

- 10a. Spike divided near the middle into an upper and a lower part which are quite unlike *Typhaceae*, p. 9.
- 10b. Spikes or racemes not distinctly divided into upper and lower halves—11.
- 11a. Leaves all basal—12.
- 11b. Leaves present on the stem 1b, in *Juncaginaceae*, p. 11.
- 12a. Stamens protruding far out of the flowers *Plantaginaceae*, p. 140.
- 12b. Stamens not protruding out of the flower *Juncaginaceae*, p. 11.
- 13a. Flowers regular, with all the petals of approximately the same size, shape, and color—14.
- 13b. Flowers irregular, with one petal distinctly different from the others in size, shape, or color—22.
- 14a. Petals 3; sepals none; flower solitary on each plant 1b, in *Aristolochiaceae*, p. 45.
- 14b. Petals 3, distinctly different in size or color from the green or greenish sepals—15.
- 14c. Parts of the perianth 4, all alike or nearly so, white 29a, in *Liliaceae*, p. 30.
- 14d. Petals 5; flowers minute, in dense heads; leaves bristly or spiny on the margin 4a, in *Umbelliferae*, p. 105.
- 14e. Parts of the perianth 6, all alike or nearly so—17.
- 15a. Flowers solitary on each stem; leaves 3, whorled 14c, in *Liliaceae*, p. 29.
- 15b. Flowers several, but possibly only one in bloom at a time, yellow, in a dense head on a leafless stalk *Xyridaceae*, p. 24.
- 15c. Flowers several, in loose open clusters, never yellow—16.
- 16a. Flowers blue, or blue and white; flower-clusters subtended by long linear leaves 1a, in *Commelinaceae*, p. 24.
- 16b. Flowers white; flower-clusters subtended only by small bracts *Alismaceae*, p. 11.
- 17a. Ovaries 3 or 6 in each flower *Juncaginaceae*, p. 11.
- 17b. Ovary one and superior, located in the center of the flower—18.
- 17c. Ovary one and inferior, appearing below the perianth as a small swelling at the end of the flower-stalk—20.
- 17d. Ovary none; flower with stamens only 27, in *Liliaceae*, p. 30.

- 18a. Stamens in each flower 3 Pontederiaceae, p. 25.
 18b. Stamens in each flower 4 or 6 or none—19.
- 19a. Perianth not woolly Liliaceae, p. 27.
 19b. Perianth woolly Haemodoraceae, p. 32.
- 20a. Stamens in each flower 6 and plainly visible; petals yellow
 Amaryllidaceae, p. 32.
 20b. Stamens in each flower 3 (in some plants the stamens are
 hard to find)—21.
- 21a. Perianth not woolly Iridaceae, p. 32.
 21b. Perianth woolly Haemodoraceae, p. 32.
- 22a. Ovary superior (defined under 17b above); stamens of the
 ordinary type of structure—23.
 22b. Ovary inferior (defined under 17c above); stamens unlike
 ordinary stamens and possibly not recognizable
 Orchidaceae, p. 33.
- 23a. Leaves triangular-heart-shaped at base
 1a, in Pontederiaceae, p. 25.
 23b. Leaves not heart-shaped at base 1b, in Commelinaceae, p. 25.

V. Herbaceous Dicotyledons

- 1a. Foliage leaves all or principally basal; flower-stalks either com-
 pletely leafless, or bearing a single pair of opposite leaves
 only. Bracts and scales are not counted as foliage leaves—3.
 1b. Foliage leaves present on the stem, either one or more in number
 and not limited to a single opposite pair—2.
- 2a. Stem-leaves all or chiefly opposite or whorled (the bract-
 like leaves of the flower-clusters may be alternate—42.
 2b. Stem-leaves all or chiefly alternate—133.
- 3a. Leaves 2 or 3 times dissected or compound—4.
 3b. Leaves once-compound—7.
 3c. Leaves simple, but possibly deeply lobed or cleft—16.
- 4a. Leaves all basal; stem-leaves none—5.
 4b. A pair of stem-leaves present—6.
- 5a. Flowers greenish, in umbels 4b, in Araliaceae, p. 105.
 5b. Flowers white, with 2 blunt spurs at their base, in racemes
 2b, in Fumariaceae, p. 63.
 5a. Petals 4; stamens 6 24, in Cruciferae, p. 66.

- 6b. Petals 5 or more; stamens numerous 33b, in Ranunculaceae, p. 61.
- 7a. Flowers consisting of a green or partly purplish spathe enclosing a fleshy spike which bears the minute individual flowers at its base 2, in Araceae, p. 23.
- 7b. Flowers not on a fleshy spike enclosed by a large spathe—8.
- 8a. Individual flowers irregular, some of the petals larger than the others—9.
- 8b. Individual flowers regular—10.
- 9a. Flowers white, in a rounded head 29a, in Leguminosae, p. 81.
- 9b. Flowers pink-purple, in a long raceme 30c, in Leguminosae, p. 82.
- 10a. Leaflets toothed—11.
- 10b. Leaflets entire—15.
- 11a. Flowers with white or yellow petals and green or greenish sepals—12.
- 11b. Flowers with one kind of perianth only (usually considered to be sepals), and this petal-like in appearance—14.
- 11c. Flowers with white petal-like sepals and much smaller, inconspicuous, club-shaped petals 27b, in Ranunculaceae, p. 60.
- 12a. Petals and sepals each four 24, in Cruciferae, p. 66.
- 12b. Petals and sepals each five—13.
- 13a. Petals white 43, in Rosaceae, p. 77.
- 13b. Petals yellow 31, in Rosaceae, p. 76.
- 14a. Divisions of the leaf separated by distinct and elongate stalks 33b, in Ranunculaceae, p. 61.
- 14b. Divisions of the leaf sessile or on very short stalks 28a, in Ranunculaceae, p. 60.
- 15a. Leaflets reverse-heart-shaped, not more than 2 cm. long 1a, in Oxalidaceae, p. 86.
- 15b. Leaflets oblong or elliptical, 4–10 cm. long 1b, in Gentianaceae, p. 115.
- 16a. Individual flowers minute, in a dense spherical fleshy head, surrounded by a single large purple-brown or green or mottled spathe, located at the surface of the ground or partly beneath it 4a, in Araceae, p. 23.
- 16b. Flowers of the composite type (Figure 15, d, e, f), with

- several or many small flowers closely crowded in a head and surrounded by a calyx-like involucre **Compositae**, p. 148.
- 16c. Flowers not in dense involucred heads—17.
- 17a. Stem-leaves a single opposite pair—18.
- 17b. Stem-leaves none—23.
- 18a. Flower one on each plant, short-stalked and almost hidden between the two leaves—19.
- 18b. Flowers several or many on each plant (possibly only one in bloom), and held well above the leaves—20.
- 19a. Flower brown; leaves entire 2, in **Aristolochiaceae**, p. 45.
- 19b. Flower white; leaves lobed 1b, in **Berberidaceae**, p. 62.
- 20a. Leaves entire, linear; stamens 5
1a, in **Portulacaceae**, p. 56.
- 20b. Leaves toothed or lobed, broader than linear—21.
- 21a. Stamens numerous; flowers white 28a, in **Ranunculaceae**, p. 60.
- 21b. Stamens 5 or 10—22.
- 22a. Petals white, fringed at the margin
5a, in **Saxifragaceae**, p. 71.
- 22b. Petals pink or purple, not fringed
1a, in **Geraniaceae**, p. 87.
- 23a. Flowers irregular, some of the petals different from the others in size or shape—24.
- 23b. Flowers regular, the petals all alike in size and shape—28.
- 24a. Leaves cylindrical and hollow 1a, in **Lobeliaceae**, p. 147.
- 24b. Leaves flat, not hollow, and more than 1 cm. long—25.
- 24c. Leaves minute, less than 1 cm. long; flowers with a spur
5, in **Lentibulariaceae**, p. 139.
- 25a. Flowers solitary at the end of each stalk—26.
- 25b. Flowers several or many in each cluster—27.
- 26a. Flowers only 2-3 mm. wide; leaves spatulate
4a, in **Scrophulariaceae**, p. 133.
- 26b. Flowers 10 mm. wide or larger, with a spur
1a, in **Violaceae**, p. 98.
- 27a. Flowers in a close spike; leaves entire
12a, in **Orchidaceae**, p. 34.
- 27b. Flowers in a branched panicle; leaves toothed or lobed
6a, in **Saxifragaceae**, p. 71.
- 28a. Flowers solitary at the end of each flower-stalk—29.
- 28b. Flowers few to many in a cluster on each stalk—34.

- 29a. Flowers yellow or cream-color—30.
 29b. Flowers white to pink or purple—31.
 30a. Water-lilies, with flowers more than 5 cm. wide
 Nymphaeaceae, p. 56.
 30b. Buttercups, with flowers less than 3 cm. wide
 7, in *Ranunculaceae*, p. 58.
 31a. Flowers only 2–3 mm. wide; leaves spatulate
 4a, in *Scrophulariaceae*, p. 133.
 31b. Flowers at least 15 mm. wide—32.
 32a. Leaves entire 2b, in *Saxifragaceae*, p. 71.
 32b. Leaves hollow and pitcher-shaped *Sarraceniaceae*, p. 69.
 32c. Leaves lobed—33.
 33a. Leaf one, deeply and irregularly lobed, with red juice
 1a, in *Papaveraceae*, p. 62.
 33b. Leaves few or several, regularly 3-lobed; juice colorless
 27a, in *Ranunculaceae*, p. 60.
 34a. Leaves thickly covered by long hairs tipped with sticky
 glands; flowers in racemes *Droseraceae*, p. 69.
 34b. Leaves flat and not covered with sticky hairs—35.
 34c. Leaves cylindrical or nearly so, about 3 mm. thick
 2a, in *Umbelliferae*, p. 105.
 35a. Petals none; flowers small, greenish or reddish, in small pan-
 icles; leaves with 2 basal lobes 4, in *Polygonaceae*, p. 46.
 35b. Petals 4 (sometimes colorless or brownish and easily overlooked)
 —36.
 35c. Petals 5 or more—37.
 36a. Flowers in close dense spikes with protruding stamens; petals
 brownish or almost colorless and chaffy in texture
 Plantaginaceae, p. 140.
 36b. Flowers in racemes, each with its own short stalk; petals
 white; stamens not protruding 54, in *Cruciferae*, p. 69.
 37a. Stamens numerous; petals bright yellow
 7, in *Ranunculaceae*, p. 58.
 37b. Stamens 10, in plain sight; flowers white to pink or purple
 —38.
 37c. Stamens 5, either in plain sight or concealed within the corolla
 —40.
 38a. Style 1 3a, in *Ericaceae*, p. 109.
 38b. Style 2—39.

- 39a. Leaves pinnately veined, oblanceolate to obovate
3a, in *Saxifragaceae*, p. 71.
- 39b. Leaves palmately veined and lobed
6b, in *Saxifragaceae*, p. 71.
- 40a. Leaves nearly as broad as long, toothed or lobed, palmately veined—41.
- 40b. Leaves much longer than wide, pinnately veined, nearly or quite entire
Plumbaginaceae, p. 113.
- 41a. Creeping plants of swamps and marshes, 15 cm. high or less; flowers few in an umbel
3, in *Umbelliferae*, p. 105.
- 41b. Erect plants of drier soil, with large branching panicles
6a, in *Saxifragaceae*, p. 71.
- 42a. Flowers without colored petals or petal-like parts, always small or minute but often in clusters of conspicuous size—43.
- 42b. Flowers with white or colored petals or petal-like parts, either large or small—64.
- 43a. Leaves whorled—44.
- 43b. Leaves opposite—48.
- 44a. Leaves compound, with 3-5 leaflets in a single whorl
1a, in *Araliaceae*, p. 105.
- 44b. Leaves simple—45.
- 45a. Flowers in large or small branched clusters, terminating the stem or its branches—46.
- 45b. Flowers axillary—47.
- 46a. Juice milky
Euphorbiaceae, p. 89.
- 46b. Juice not milky
7b, in *Rubiaceae*, p. 142.
- 47a. Plant prostrate, repeatedly branched, forming mats on the ground; leaves entire
1a, in *Aizoaceae*, p. 53.
- 47b. Plant spreading or ascending on muddy shores; leaves toothed
2b, in *Haloragidaceae*, p. 104.
- 48a. Leaves reduced to small scales on the fleshy stems; salt-marsh plants
1a, in *Chenopodiaceae*, p. 49.
- 48b. Leaves compound or deeply lobed or dissected—49.
- 48c. Leaves simple, entire or toothed—51.
- 49a. Flowers in axillary spikes, racemes, or panicles
7a and 7b, in *Urticaceae*, p. 44.
- 49b. Flowers in terminal racemes or spikes—50.
- 49c. Flowers sessile in the axils of the leaves
1b, in *Haloragidaceae*, p. 104.

- 50a. Tall weedy plants of dry or moist soil; leaves 5 cm. long or more 217a and 217b, in *Compositae*, p. 175.
- 50b. Spreading or ascending plants of muddy shores; leaves 3 cm. long or less 2b, in *Haloragidaceae*, p. 104.
- 51a. Juice milky 2a and 2b, in *Euphorbiaceae*, p. 89.
- 51b. Juice not milky—52.
- 52a. Flowers in well developed spikes, racemes, or other clusters, which are either terminal or axillary—53.
- 52b. Flowers solitary or few in the axils of the leaves, or in the forks of the stem, or at the end of the branches; never in conspicuous clusters—55.
- 53a. Plants with weak ascending or prostrate stems, growing in mud or shallow water; leaves not more than 3 cm. long 2b, in *Haloragidaceae*, p. 104.
- 53b. Plants with twining or erect stems—54.
- 54a. Flower-clusters all or mostly terminal 219, in *Compositae*, p. 175.
- 54b. Flowers axillary 7a and 7c, in *Urticaceae*, p. 44.
- 55a. Plants of sea-beaches and salt-marshes, with thick fleshy leaves—56.
- 55b. Plants of inland situations, never in salt-marshes or on beaches—57.
- 56a. Styles 3-5; leaves obovate or spatulate 1b, in *Aizoaceae*, p. 53.
- 56b. Style 1; leaves linear to linear-oblong 2a, in *Primulaceae*, p. 113.
- 57a. Leaves ovate to round or kidney-shaped—58.
- 57b. Leaves linear, awl-shaped, sharp-pointed 1a, in *Illecebraceae*, p. 52.
- 57c. Leaves linear to oblong, not sharp-pointed—59.
- 58a. Leaves crenately toothed or shallowly lobed 2a, in *Saxifragaceae*, p. 70.
- 58b. Leaves entire 11a, in *Caryophyllaceae*, p. 54.
- 59a. Erect or spreading plants of dry or upland soil; flowers terminal or in the forks of the stem—60.
- 59b. Spreading or prostrate plants of wet ground, mud, or swamps; flowers axillary—61.
- 60a. Leaves silvery beneath 1a, in *Euphorbiaceae*, p. 89.
- 60b. Leaves not silvery beneath 2, in *Illecebraceae*, p. 52.

61a. With much divided submerged leaves

2b, in Haloragidaceae, p. 104.

61b. Submerged leaves none, or scarcely different from the aerial ones —62.

62a. With neither calyx nor corolla Callitrichaceae, p. 90.

62b. With a 4-lobed perianth; stamens 2 Elatinaceae, p. 97.

62c. With 4 or more sepals and often 4 petals also; stamens 4 —63.

63a. Sepals distinctly 4

1a, in Onagraceae, p. 102.

63b. Sepals apparently 8

3b, in Lythraceae, p. 101.

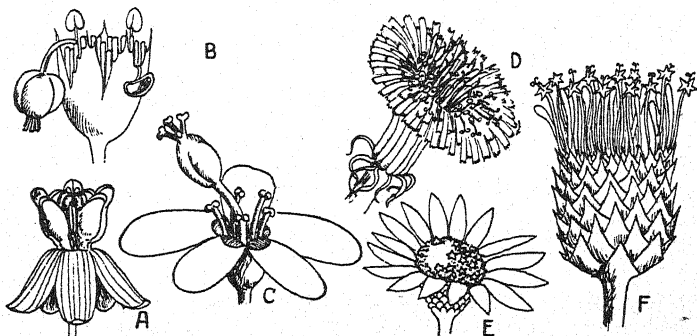


FIG. 15. Types of flowers, illustrating number 64. A. milkweed type, with reflexed petals concealing the sepals and with 5 erect hollow bodies around the center of the flower; B, C. spurge type, with 5 bracts which are often petal-like and a protruding ovary with 3 styles and stigmas; D, E, F. composite type, with minute flowers in a close head, surrounded by numerous bracts at base.

64a. Plants with flowers of the Composite type, consisting of several or many small flowerets closely aggregated into a dense head, surrounded at its base by a calyx-like involucre of small bracts, the whole head resembling a single flower (Figure 15, d, e, f) —65.

64b. Plants of the Spurge type, with a short-stalked, more or less 3-lobed ovary with 3 styles protruding from the center of some or all of the small flowers; juice almost always milky (Figure 15, b, c) Euphorbiaceae, p. 89.

64c. Plants of the Milkweed type, with flowers in umbels, the corolla bent back and concealing the sepals, the center of

the flower surrounded by 5 erect hollow bodies, and the stamens so greatly modified that they do not resemble ordinary stamens; juice milky (Figure 15, a)

Asclepiadaceae, p. 117.

64d. Plants with flowers of more normal structure, not agreeing with any of the three types described above—68.

65a. Stem, leaves and petioles more or less prickly or thorny; heads ovoid or short-cylindrical, 5-10 cm. high

Dipsacaceae, p. 146.

65b. Stem and leaves neither prickly nor thorny—66.

66a. Stem square; foliage with a minty odor when crushed; individual flowers in the middle of each head irregular

Labiatae, p. 123.

66b. Stem generally not square; foliage not with an odor of mint; individual flowers in the center of each head regular—67.

67a. Bracts of the involucre closely resembling the leaves in size, shape and color; leaves whorled, 2 cm. long or less

7c, in *Rubiaceae*, p. 142.

67b. Bracts of the leaves very different from the foliage leaves in size or shape or color (true Composites) *Compositae*, p. 148.

68a. Individual flowers small or minute, never more than 5 mm. long or wide, and usually not more than 3 mm. (Many plants with flowers between 3 and 5 mm. may be found either here or in 68b)—69.

68b. Individual flowers more conspicuous, always more than 3 mm. and often more than 5 mm. wide—92.

69a. Flowers irregular, the colored or petal-like parts differing among themselves in size or shape—70.

69b. Flowers regular, all the colored or petal-like parts alike in size and shape, or very nearly so—74.

70a. Stamens 4; none of the sepals petal-like; lobes of the corolla 4 or 5 or sometimes almost indistinguishable—71.

70b. Stamens 2; none of the sepals petal-like; lobes of the corolla 4 or 5, or the corolla 2-lipped—73.

70c. Stamens 6-8; 2 of the sepals petal-like and 3 sepal-like; petals 3, more or less united with each other and with the stamens; flowers in terminal spikes, racemes, or heads

Polygalaceae, p. 88.

71a. Flowers sessile in elongated terminal spikes—72.

- 71b. Flowers in axillary clusters, or in terminal clusters or racemes
Labiatae, p. 123.
- 72a. Teeth of the calyx equal or nearly so; flowers irregularly crowded in spikes
Verbenaceae, p. 123.
- 72b. Teeth of the calyx 3 long and 2 short; flowers in a loose spike, mostly in opposite pairs
Phrymaceae, p. 140.
- 73a. Flowers in terminal or axillary spikes or racemes, or solitary in the axils
 36, in **Scrophulariaceae**, p. 138.
- 73b. Flowers in axillary clusters; stems square
Labiatae, p. 123.
- 74a. Flowers with either a calyx or a corolla, but not with both—75.
- 74b. Flowers with both calyx and corolla—78.
- 75a. Leaves whorled and compound
 1a, in **Araliaceae**, p. 105.
- 75b. Leaves whorled and simple—76.
- 75c. Leaves opposite—77.
- 76a. Divisions of the perianth 3 or 4
 2b, in **Rubiaceae**, p. 141.
- 76b. Divisions of the perianth 5
 1a, in **Aizoaceae**, p. 53.
- 77a. Plants of cultivated ground or waste places
Valerianaceae, p. 146.
- 77b. Plants of sea-beaches and salt-marshes, with thick fleshy leaves—56.
- 78a. Petals united with each other, so that the whole corolla may be pulled off in one piece—79.
- 78b. Petals separate from each other—87.
- 79a. Leaves whorled
 2b, in **Rubiaceae**, p. 141.
- 79b. Leaves opposite—80.
- 80a. Flowers sessile or nearly so in the axils of the leaves—81.
- 80b. Flowers in terminal spikes or clusters or racemes, or in axillary racemes—84.
- 81a. Leaves with conspicuous stipules
 3a, in **Rubiaceae**, p. 141.
- 81b. Leaves without stipules—82.
- 82a. Flowers several in each axil, in dense clusters—83.
- 82b. Flowers solitary in each axil; stamens 2
 36, in **Scrophulariaceae**, p. 138.
- 83a. Stamens 2
 2a, in **Labiatae**, p. 123.
- 83b. Stamens 4
 47d, in **Labiatae**, p. 130.
- 84a. Stamens 2; juice not milky
 36, in **Scrophulariaceae**, p. 138.
- 84b. Stamens 4; juice not milky—85.
- 84c. Stamens 5; juice milky
 1b, in **Apocynaceae**, p. 117.

- 85a. Stem-leaves less than 5 mm. long 2b, in *Gentianaceae*, p. 115.
 85b. Stem-leaves not scale-like, more than 1 cm. long—86.
 86a. Foliage with a strong odor of mint 47d, in *Labiatae*, p. 130.
 86b. Foliage without an odor of mint *Verbenaceae*, p. 123.
 87a. Flowers on stalks from the axils of the leaves; petals 4 or 5,
 but sometimes so deeply lobed that they appear to be 8 or 10
Caryophyllaceae, p. 53.
 87b. Flowers sessile in the axils of the leaves—88.
 87c. Flowers in terminal clusters—89.
 88a. Sepals 2; petals 5, yellow; stamens 7 or more
 1b, in *Portulacaceae*, p. 56.
 88b. Sepals 2; petals 2; stamens 2 *Elatinaceae*, p. 97.
 88c. Sepals 4; petals 4; stamens 4 1a, in *Onagraceae*, p. 102.
 88d. Teeth of the calyx 6; petals 6; stamens 6—8
 3a, in *Lythraceae*, p. 101.
 89a. Flowers bright yellow, with 5 petals *Hypericaceae*, p. 96.
 89b. Flowers reddish or greenish, with 3 petals, in panicles
 1b, in *Cistaceae*, p. 97.
 89c. Flowers white to pink or red, with 4 or 5 petals—90.
 89d. Flowers white, in slender racemes; petals 2, but so deeply lobed
 that they appear to be 4 1d, in *Onagraceae*, p. 102.
 90a. Petals 5, often deeply lobed at the end and then appearing
 like 10 *Caryophyllaceae*, p. 53.
 90b. Petals 4—91.
 91a. Principal leaves less than 1 cm. long
 7a, in *Caryophyllaceae*, p. 54.
 91b. Principal leaves more than 2 cm. long
 1c, in *Onagraceae*, p. 102.
 92a. The conspicuous part of the perianth composed of separate
 parts; flowers always regular—93.
 92b. The conspicuous part of the perianth composed of united
 parts—111.
 93a. Leaves compound or deeply lobed—94.
 93b. Leaves simple, entire or toothed—96.
 94a. Stamens 5 or 10—95.
 94b. Stamens 6 23a, in *Cruciferae*, p. 66.
 94c. Stamens more than 10 25, in *Ranunculaceae*, p. 60.
 95a. Flowers yellow *Oxalidaceae*, p. 86.
 95b. Flowers purple, varying to white *Geraniaceae*, p. 87.

- 96a. Flowers yellow—97.
 96b. Flowers of some other color—102.
 97a. Stamens 5—98.
 97b. Stamens more than 5—101.
 98a. Style 1 2c, in *Primulaceae*, p. 114.
 98b. Styles 3 or more—99.
 99a. Prostrate plants with thick fleshy obovate leaves
 1b, in *Portulacaceae*, p. 56.
 99b. Erect plants, with leaves of average thickness—100.
 100a. Styles 3 *Hypericaceae*, p. 96.
 100b. Styles 5 *Linaceae*, p. 86.
 101a. Styles 3 *Hypericaceae*, p. 96.
 101b. Style 1 or none *Cistaceae*, p. 97.
 102a. Petals 3 14c, in *Liliaceae*, p. 29.
 102b. Petals 4 or more—103.
 103a. Ovaries more than 1 in each flower and easily visible—104.
 103b. Ovary 1 or none in each flower. In some of these plants the
 ovary is difficult to see, and in such cases one style indi-
 cates one ovary—105.
 104a. Both sepals and petals present; stamens 8 or 10
 2, in *Crassulaceae*, p. 70.
 104b. Only sepals present, 4, thick and leathery; stamens many
 25a, in *Ranunculaceae*, p. 60.
 105a. Style and ovary none 17b, in *Caryophyllaceae*, p. 55.
 105b. Styles 2-5 on each ovary *Caryophyllaceae*, p. 53.
 105c. Style one on each ovary—106.
 106a. Stamens about twice as many as the petals—107.
 106b. Stamens just as many as the petals, or fewer—109.
 107a. Leaves toothed 11b, in *Ericaceae*, p. 110.
 107b. Leaves entire, with 3 or 5 principal longitudinal veins
 Melastomaceae, p. 102.
 107c. Leaves entire, with 1 principal midvein—108.
 108a. Petals notched at the end 1c, in *Onagraceae*, p. 102.
 108b. Petals not notched at the end *Lythraceae*, p. 101.
 109a. Flowers in terminal racemes; petals actually 2, but so deeply
 notched that they appear to be 4 1d, in *Onagraceae*, p. 102.
 109b. Flowers scattered along the stem in the axils of the leaves,
 which are only 1-2 cm. long 3b, in *Primulaceae*, p. 114.
 109c. Flowers solitary and terminal, or in terminal clusters—110.

- 120a. Trailing vine with blue axillary flowers
1a, in Apocynaceae, p. 117.
- 120b. Plants erect, or spreading and freely branched—121.
- 121a. Juice milky; flowers pink or white, bell-shaped or funnel-form
1b, in Apocynaceae, p. 117.
- 121b. Juice not milky—122.
- 122a. Corolla salver-form, with a very slender tube and widely spreading lobes (Figure 12C) Polemoniaceae, p. 119.
- 122b. Corolla tubular and nearly closed at the mouth; or tubular with erect lobes; or open funnel-form, 3-5 cm. long with spreading petals (Figure 24) Gentianaceae, p. 115.
- 122c. Corolla rotate or widely spreading, the tubular or united portion much shorter than the lobes—110.
- 123a. Stamens 2—124.
- 123b. Stamens 3 Valerianaceae, p. 146.
- 123c. Stamens 4—125.
- 123d. Stamens 5 Gentianaceae, p. 115.
- 124a. Flowers several and sessile in dense axillary clusters
3, in Labiatae, p. 123.
- 124b. Flowers in terminal racemes, or in axillary racemes, or solitary in the axils 36, in Scrophulariaceae, p. 138.
- 125a. Flowers in a nodding pair at the top of a slender stalk
3a, in Caprifoliaceae, p. 144.
- 125b. Flowers not in nodding pairs—126.
- 126a. Flowers blue or white, 3-6 mm. wide Verbenaceae, p. 123.
- 126b. Flowers rose-purple, 1 cm. or more wide or long
17a, in Scrophulariaceae, p. 135.
- 126c. Flowers yellow, 1 cm. or more wide or long
12a, in Scrophulariaceae, p. 135.
- 127a. A climbing vine with compound leaves
2a, in Fumariaceae, p. 63.
- 127b. Stems not climbing—128.
- 128a. Ovary very deeply 4-lobed, appearing almost like 4 separate ovaries at the bottom of the calyx when the corolla is removed Labiatae, p. 123.
- 128b. Ovary not 4-lobed—129.
- 129a. Stamens 2—130.
- 129b. Stamens 4—131.
- 129c. Stamens 6-8; 3 of the sepals sepal-like and 2 petal-like; true

petals 3, united with each other and with the stamens;
flowers in terminal spikes, racemes, or heads

Polygalaceae, p. 88.

130a. Corolla with a spur behind; stem-leaves reduced to small
scales 5, in *Lentibulariaceae*, p. 139.

130b. Corolla not spurred; stem-leaves not scale-like

Scrophulariaceae, p. 133.

131a. Flowers blue, purplish, or white, 3-6 mm. wide or long, in
slender terminal spikes—132.

131b. Flowers not agreeing with 131 in some feature of color or size
or position, or with a conspicuous spur on the corolla

Scrophulariaceae, p. 133.

132a. Teeth of the calyx (sepals) nearly or quite alike; flowers
blue or white, in rather crowded spikes

Verbenaceae, p. 123.

132b. Teeth of the calyx very unlike, the upper 3 long and slender,
the lower 2 much shorter; flowers in separate opposite pairs,
purplish, forming a loose spike

Phrymaceae, p. 140.

— 133 —

133a. Flowers individually small or minute, greenish or brownish,
or occasionally whitish or reddish or yellowish, but without
any bright or colored petals or petal-like parts; often in
clusters of conspicuous size—134.

133b. Flowers with white or colored petals or petal-like parts, either
large or small in size—135.

134a. Leaves deeply lobed, or compound, or dissected—135.

134b. Leaves simple, and entire, or toothed, or shallowly lobed
—145.

135a. Leaves once-palmately lobed or compound, or with 3 lobes, or
3 leaflets—136.

135b. Leaves once-pinnately lobed or compound—138.

135c. Leaves dissected into numerous segments, but not truly com-
pound with separate and distinct leaflets—142.

135d. Leaves 2-3 times compound, with their leaflets separated by
distinct stalks—143.

136a. Individual flowers at the base of a fleshy elongated spike,

- surrounded and concealed by a conspicuous green, or brown and green, spathe 2, in *Araceae*, p. 23.
- 136b. Individual flowers 3-4 cm. wide, greenish 24b, in *Ranunculaceae*, p. 60.
- 136c. Individual flowers small and not surrounded by a large spathe—137.
- 137a. Flowers crowded in dense terminal umbels or heads 14a, in *Umbelliferae*; p. 106.
- 137b. Flowers axillary, or in terminal racemes or panicles—141.
- 138a. Leaves actually compound, with separate leaflets—189.
- 138b. Leaves merely pinnately lobed or pinnatifid—140.
- 139a. Leaflets entire; flowers axillary and solitary *Limnanthaceae*, p. 91.
- 139b. Leaflets toothed; flowers in terminal spikes or heads 44a and 44b, in *Rosaceae*, p. 77.
- 140a. Flowers axillary or in unbranched spikes *Haloragidaceae*, p. 104.
- 140b. Flowers in branched or unbranched racemes 56, in *Cruciferae*, p. 69.
- 140c. Flowers in branching panicles—141.
- 141a. Leaves with 2 basal lobes only, otherwise entire, with sheathing stipules surrounding the stem above the base of the leaf 4, in *Polygonaceae*, p. 46.
- 141b. Leaves with several lobes; stipules none *Chenopodiaceae*, p. 49.
- 142a. Flowers in axillary clusters or leafy panicles *Chenopodiaceae*, p. 49.
- 142b. Flowers in slender terminal racemes 217a, in *Compositae*, p. 175.
- 143a. Flowers in symmetrical umbels *Araliaceae*, p. 104.
- 143b. Flowers in racemes or spikes 33c, in *Ranunculaceae*, p. 61.
- 143c. Flowers in small or large branching panicles—144.
- 144a. Stamens in each flower 6 1c, in *Berberidaceae*, p. 62.
- 144b. Stamens in each flower numerous or none 33d, in *Ranunculaceae*, p. 61.
- 145a. Flowers in dense cottony heads; plants more or less white-woolly 93, in *Compositae*, p. 161.

- 145b. Pistillate flowers in an ovoid spiny involucre, ripening into a spiny bur 218, in Compositae, p. 175.
- 145c. Flowers subtended by conspicuous palmately cleft axillary bracts 2a, in Euphorbiaceae, p. 89.
- 145d. Flowers with none of the preceding characters—146.
- 146a. Plants of nettle-like character, with stinging hairs on the stem and leaves 6b, in Urticaceae, p. 44.
- 146b. Plants with milky or colored juice Euphorbiaceae, p. 89.
- 146c. Plants with sheathing stipules surrounding the stem above the base of the leaf Polygonaceae, p. 46.
- 146d. Climbing plants—222.
- 146e. Plants with none of the preceding structures or habits—147.
- 147a. Leaves densely silvery beneath 1a, in Euphorbiaceae, p. 89.
- 147b. Leaves not silvery beneath—148.
- 148a. Flowers in terminal, or terminal and axillary, clusters—149.
- 148b. Flowers all axillary, either solitary or in clusters—156.
- 149a. Flowers in racemes or unbranched spikes—150.
- 149b. Flowers in branched clusters—153.
- 150a. Leaves toothed or lobed—151.
- 150b. Leaves entire—152.
- 151a. Racemes or spikes mixed with leaves 219a, in Compositae, p. 175.
- 151b. Racemes leafless 56, in Cruciferae, p. 69.
- 152a. Leaves heart-shaped Piperaceae, p. 37.
- 152b. Leaves linear or lanceolate Resedaceae, p. 69.
- 153a. Individual flowers separate and sessile 219a, in Compositae, p. 175.
- 153b. Individual flowers separate and on stalks—154.
- 153c. Individual flowers crowded in close clusters—155.
- 154a. Leaves lanceolate, finely toothed, 5-10 cm. long 1a, in Crassulaceae, p. 70.
- 154b. Leaves entire, rarely more than 2 cm. long 1b, in Cistaceae, p. 97.
- 154c. Leaves shallowly palmately lobed, 6-10 cm. wide, mostly basal 6a, in Saxifragaceae, p. 71.
- 155a. Flower-clusters mingled with sharp-pointed bracts Amaranthaceae, p. 51.
- 155b. Flower-clusters without sharp-pointed bracts Chenopodiaceae, p. 49.

- 156a. Leaves linear—157.
156b. Leaves lanceolate to round—158.
157a. Sepals plainly 4; flowers solitary in each leaf-axil
3b, in *Onagraceae*, p. 102.
157b. Sepals 5, often very small 1b, in *Chenopodiaceae*, p. 49.
158a. Leaves coarsely and sharply toothed; a tall erect plant of
salt-marshes 219a, in *Compositae*, p. 175.
158b. Leaves entire, or with rounded teeth, or with very shallow
rounded lobes—159.
159a. Flowers solitary in each axil—160.
159b. Flowers in small clusters in the axils—161.
160a. Leaves broadly ovate to round, with low rounded teeth or
shallow lobes 2a, in *Saxifragaceae*, p. 70.
160b. Leaves lanceolate, entire 2b, in *Onagraceae*, p. 102.
161a. Flower-clusters mixed with bracts which are as long as, or
longer than, the flowers—162.
161b. Flower-clusters without conspicuous bracts
Chenopodiaceae, p. 49.
162a. Leaves broadest below the middle, acuminate
6a, in *Urticaceae*, p. 44.
162b. Leaves broadest above the middle, obtuse or mucronate
1a, in *Amaranthaceae*, p. 51.

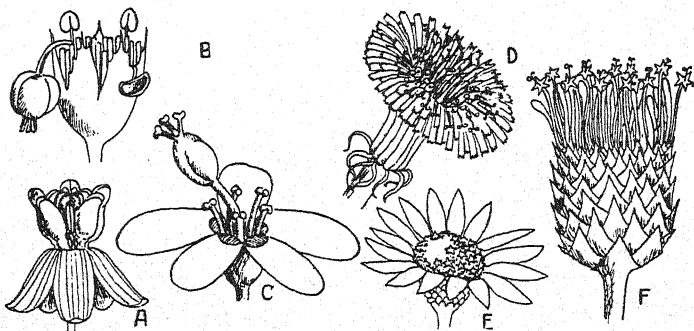


FIG. 16. Types of flowers, illustrating number 163. *A.* milkweed type, with reflexed petals concealing the sepals and with 5 erect hollow bodies around the center of the flower; *B, C.* spurge type, with 5 bracts which are often petal-like and a protruding ovary with 3 styles and stigmas; *D, E, F.* composite type, with minute flowers in a close head, surrounded by numerous bracts at base.

- 163a. Plants with flowers of the Composite type (Figure 16, *d, e, f*), consisting of several or many small flowerets closely aggregated into a dense head, surrounded at its base by a calyx-like involucre of small bracts, the whole head resembling a single flower—164.
- 163b. Plants of the Spurge type (Figure 16, *b, c*), with a short-stalked, more or less 3-lobed ovary with 3 styles protruding from the center of some or all of the small flowers; juice almost always milky *Euphorbiaceae*, p. 89.
- 163c. Plants of the Milkweed type (Figure 16, *a*), with flowers in umbels, the corolla bent back and concealing the sepals, the center of the flower surrounded by 5 erect hollow bodies, and the stamens so greatly modified that they do not resemble ordinary stamens *Asclepiadaceae*, p. 117.
- 163d. Plants with flowers of more normal structure, not agreeing with any of the types described above—167.
- 164a. Calyx of each individual floweret none or very small and inconspicuous; a 2-branched style protrudes from some or all of the flowerets and is plainly visible—165.
- 164b. Calyx present; style not branched or not protruded from the corolla—166.
- 165a. Leaves linear and with slender spines or bristles along the margin; flowers pale blue or white, in globose or broadly ovoid heads *2d*, in *Umbelliferae*, p. 105.
- 165b. Leaves either not linear, or not spiny or bristly along the margin; true Composites, resembling a daisy, a dandelion or a thistle *Compositae*, p. 148.
- 166a. Leaves compound with 3 leaflets; individual flowers quite irregular *27b*, in *Leguminosae*, p. 81.
- 166b. Leaves simple; individual flowers regular *2a*, in *Campanulaceae*, p. 147.
- 167a. Flowers small, never more than 5 mm. long or wide and often less than 3 mm.—168.
- 167b. Flowers larger, always more than 3 mm. and often more than 5 mm. long or wide. The distinction between these groups is made merely for convenience, and plants with flowers between 3 and 5 mm. long or wide may be found in both groups—204.
- 168a. Flowers regular—169.

- 168b. Flowers irregular—199.
- 169a. Flowers in umbels—170.
- 169b. Flowers not in umbels—172.
- 170a. Leaves (at least part of them) with tendrils near their base;
flowers carrion-scented 2a, in Liliaceae, p. 27.
- 170b. Leaves never with tendrils; flowers not ill-scented—171.
- 171a. Umbels simple, or branched into compound umbels; styles 2
Umbelliferae, p. 105.
- 171b. Umbels few or many, arranged in a raceme or panicle or rounded
cluster, but not in a compound umbel; styles 5
Araliaceae, p. 104.
- 172a. Leaves compound, or dissected, or lobed more than halfway
to their base or midvein—173.
- 172b. Leaves simple, and entire, toothed, or shallowly lobed—179.
- 173a. Flowers yellow—174.
- 173b. Flowers not yellow—176.
- 174a. Petals 5; stamens 5 or more—175.
- 174b. Petals 4; stamens 6 Cruciferae, p. 63.
- 175a. Leaves once-pinnate, with several toothed leaflets and with
smaller leaflets scattered between the larger ones
33b, in Rosaceae, p. 76.
- 175b. Leaves palmately cleft 12a, in Ranunculaceae, p. 58.
- 176a. Stamens 4, or stamens numerous; in either case much longer
than the small inconspicuous petals—177.
- 176b. Stamens 6, often almost or quite concealed within the
flower, or with only their anthers protruding—178.
- 177a. Leaves ternately decompound; flowers in spikes, racemes, or
panicles 33c and 33d, in Ranunculaceae, p. 61.
- 177b. Leaves once-pinnate; flowers in spikes or heads
44, in Rosaceae, p. 77.
- 178a. Flowers axillary, the 3 sepals and 3 petals both spreading
Limnanthaceae, p. 91.
- 178b. Flowers in terminal racemes, the 4 sepals usually erect;
petals 4 Cruciferae, p. 63.
- 179a. Perianth consisting of only one circle of parts, ordinarily con-
sidered to be the calyx, or with the calyx and corolla alike
in size and color—180.
- 179b. Perianth consisting of both calyx and corolla, which are quite
unlike in size or color—187.

- 180a. Leaves entire—181.
180b. Leaves entire, but spiny or bristly on the margin; flowers bluish or white, in dense rounded heads 2d, in Umbelliferae, p. 105.
180c. Leaves toothed or lobed—185.
181a. Stems twining; leaves heart-shaped, with several principal veins Dioscoreaceae, p. 32.
181b. Stems twining; leaves not heart-shaped, or with only 1 principal midvein 31, in Polygonaceae, p. 49.
181c. Stems not twining—182.
182a. Leaves with sheathing stipules surrounding the stem above the base of each leaf Polygonaceae, p. 46.
182b. Leaves without sheathing stipules—183.
183a. Plants 1-4 dm. high; flowers in small rounded terminal heads or clusters—184.
183b. Plant 8-20 dm. high; flowers in long racemes Phytolaccaceae, p. 52.
184a. Leaves elliptical, smooth; flowers in rounded clusters, white Santalaceae, p. 45.
184b. Leaves linear or nearly so, hairy; flowers in dense heads, usually blue 2a, in Campanulaceae, p. 147.
185a. Leaves lanceolate, sharply toothed 1a, in Crassulaceae, p. 70.
185b. Leaves ovate to round, with blunt or rounded teeth or lobes—186.
186a. Flowers axillary 2a, in Saxifragaceae, p. 70.
186b. Flowers in terminal panicles 6a, in Saxifragaceae, p. 71.
187a. Corolla with 3 petals 1b, in Cistaceae, p. 97.
187b. Corolla with 4 petals or lobes, the upper lobe sometimes slightly notched—188.
187c. Corolla with 5 petals or 5 lobes, or more—190.
188a. Corolla of united petals; stamens 2 36b, in Scrophulariaceae, p. 138.
188b. Corolla of separate petals—189.
189a. Stamens 6 or rarely 2, scarcely protruding from the flower Cruciferae, p. 63.
189b. Stamens 4 or 8 Onagraceae, p. 102.
190a. Petals separate from each other—191.
190b. Petals united with each other—196.

191a. Flowers yellow—192.

191b. Flowers not yellow—193.

192a. Leaves obovate, thick and fleshy; prostrate weeds of cultivated soil and waste places 1b, in *Portulacaceae*, p. 56.

192b. Leaves lanceolate to linear, not fleshy; plants of marshes and wet shores 8a, in *Ranunculaceae*, p. 58.

193a. Principal leaves basal 3, in *Saxifragaceae*, p. 71.

193b. Principal leaves on the stem, lanceolate to oblong or linear—194.

194a. Leaves finely and sharply toothed; flowers in terminal clusters 1a, in *Crassulaceae*, p. 70.

194b. Leaves entire; flowers solitary in the axils 2a, in *Lythraceae*, p. 101.

194c. Leaves either entire, or spiny or bristly on the margin; flowers in dense heads—195.

195a. Leaves elongated, linear, bristly or spiny on the margin 2d, in *Umbelliferae*, p. 105.

195b. Leaves 1-3 cm. long, hairy on the surface 2a, in *Campanulaceae*, p. 147.

196a. Leaves nearly circular, clasping the stem at base; flowers axillary 1a, in *Campanulaceae*, p. 146.

196b. Leaves not clasping the stem at base—197.

197a. Stem and leaves perfectly smooth; flowers in terminal racemes 1b, in *Primulaceae*, p. 113.

197b. Stem and leaves hairy—198.

198a. Flowers either axillary or in racemes *Boraginaceae*, p. 121.

198b. Flowers in dense terminal heads 2a, in *Campanulaceae*, p. 147.

199a. Leaves compound, or deeply lobed, or dissected—200.

199b. Leaves simple, either entire, toothed, or shallowly lobed—201.

200a. Leaves with 3 leaflets *Leguminosae*, p. 77.

200b. Leaves pinnately compound and tipped with a tendril 6a, in *Leguminosae*, p. 79.

200c. Leaves irregularly dissected 3a, in *Fumariaceae*, p. 63.

201a. Leaves shallowly palmately lobed; flowers in terminal panicles; stamens 5 6a, in *Saxifragaceae*, p. 71.

201b. Leaves toothed or entire; stamens not exactly 5—202.

- 202a. Flowers nearly regular, the corolla with 4 lobes, or the upper lobe slightly notched; stamens 2, protruding
36b, in *Scrophulariaceae*, p. 138.
- 202b. Flowers very irregular; stamens 6 or more—203.
- 203a. Spikes or racemes rarely more than 3 cm. long; petals more or less united into a tube
Polygalaceae, p. 88.
- 203b. Spikes or racemes more than 5 cm. long; petals separate from each other, some of them deeply lobed; stamens 12 or more
Resedaceae, p. 69.
- 204a. Flowers irregular, the petals different in size or shape, or the corolla unequally lobed—205.
- 204b. Flowers regular—216.
- 205a. Flowers provided with one or more spurs—206
- 205b. Flowers without spurs at the base—210.
- 206a. Leaves compound, or parted to the very base—207.
- 206b. Leaves entire or toothed—208.
- 207a. Flowers blue; spur slender, conical; stamens more than 6
4b, in *Ranunculaceae*, p. 57.
- 207b. Flowers white or pinkish or yellow; spur blunt or sack-like; stamens 6
Fumariaceae, p. 63.
- 207c. Flowers yellow and red; spurs 5 4a, in *Ranunculaceae*, p. 57.
- 208a. Stamens 2
Lentibulariaceae, p. 139.
- 208b. Stamens 4
5a, in *Scrophulariaceae*, p. 134.
- 208c. Stamens 5—209.
- 209a. Flowers blue, yellow, or white; plants 1-5 dm. high (violets)
Violaceae, p. 98.
- 209b. Flowers yellow, spotted with red or brown; plants 5-12 dm. high
Balsaminaceae, p. 93.
- 210a. Leaves compound, or divided to the very base—211.
- 210b. Leaves entire or toothed or lobed—212.
- 211a. Stamens 10, concealed between the two lower petals; flowers never in definite compound umbels
Leguminosae, p. 77.
- 211b. Stamens 5, protruding; flowers in compound umbels
Umbelliferae, p. 105.
- 212a. Only the calyx present, and bent into an S-shaped brown flower
1a, in *Aristolochiaceae*, p. 45.
- 212b. The conspicuous part of the flower is the cup-shaped or

- tubular calyx, which bears the small petals near its margin
6a, in *Saxifragaceae*, p. 71.
- 212c. Flowers of more normal structure, with neither of the above peculiarities—213.
- 213a. Stamens 2 or 4 *Scrophulariaceae*, p. 133.
- 213b. Stamens 5—214.
- 213c. Stamens 10 *Leguminosae*, p. 77.
- 214a. Anthers united; corolla split lengthwise down the upper side, with the anthers protruding *Lobeliaceae*, p. 147.
- 214b. Anthers separate—215.
- 215a. Corolla widely spreading; some or all of the filaments hairy
1a, in *Scrophulariaceae*, p. 133.
- 215b. Corolla funnel-form, dull yellow and purple; filaments not hairy
6a, in *Solanaceae*, p. 132.
- 215c. Corolla funnel-form, bright blue or violet; filaments not hairy
4a, in *Boraginaceae*, p. 120.
- 216a. Perianth consisting of one circle of parts, usually considered to be the calyx; or the sepals and petals essentially alike in form and color—217.
- 216b. Perianth consisting of both calyx and corolla and these unlike each other in shape or size or color—224.
- 217a. Leaves deeply lobed, or dissected, or compound—218.
- 217b. Leaves entire, or toothed, or shallowly lobed—220.
- 218a. Stamens 4; sepals 4; flowers white, in dense spikes
44b, in *Rosaceae*, p. 77.
- 218b. Stamens 5; petals 5; flowers white or yellow, in umbels or heads
Umbelliferae, p. 105.
- 218c. Stamens 6; sepals 6; flowers yellowish, in panicles
1c, in *Berberidaceae*, p. 62.
- 218d. Stamens 10 or more—219.
- 219a. Leaves with stipules adhering to the petiole; sepals 4
44a, in *Rosaceae*, p. 77.
- 219b. Leaves without stipules; sepals almost always 5 or more
Ranunculaceae, p. 57.
- 220a. Leaves with sheathing stipules surrounding the stem above the base of each leaf
Polygonaceae, p. 46.
- 220b. Leaves without sheathing stipules; stipules of other forms may be present—221.

- 221a. Climbing vines; stamens 6; divisions of the perianth 6
—222.
- 221b. Not climbing; stamens 5 or 10—223.
- 222a. Climbing by tendrils; flowers ill-scented, in umbels
2a, in Liliaceae, p. 27.
- 222b. Twining; flowers not ill-scented, in racemes or panicles
Dioscoreaceae, p. 32.
- 223a. Stamens 5; flowers in small rounded terminal clusters
Santalaceae, p. 45.
- 223b. Stamens 5; flowers in umbels or heads Umbelliferae, p. 105.
- 223c. Stamens 5; flowers in loosely branched panicles
6a, in Saxifragaceae, p. 71.
- 223d. Stamens 10; flowers in racemes Phytolaccaceae, p. 52.
- 223e. Stamens numerous. Ranunculaceae, p. 57.
- 224a. Petals united with each other to a greater or less extent, in some cases only at their bases, in others nearly to their tips
—225.
- 224b. Petals completely separate from each other—240.
- 225a. Stamens 2 or 4 Scrophulariaceae, p. 133.
- 225b. Stamens 3, as shown by the number of filaments, the anthers cohering in a mass; vines climbing by tendrils; flowers either staminate or pistillate, but both kinds may be found on the same plant Cucurbitaceae, p. 146.
- 225c. Stamens 5—226.
- 225d. Stamens 6 2a, in Fumariaceae, p. 63.
- 225e. Stamens 8 15a, in Ericaceae, p. 110.
- 225f. Stamens 10—239.
- 225g. Stamens more than 10, united by their filaments
Malvaceae, p. 95.
- 226a. Leaves compound or deeply lobed—227.
- 226b. Leaves entire or toothed or shallowly lobed—230.
- 227a. Corolla saucer-shaped or wheel-shaped Solanaceae, p. 131.
- 227b. Corolla funnel-form or bell-shaped—228.
- 228a. Leaves truly compound or divided to the very base—229.
- 228b. Leaves merely lobed 6a, in Solanaceae, p. 132.
- 229a. Leaflets or divisions of the leaf entire
1b, in Gentianaceae, p. 115.
- 229b. Leaflets or divisions of the leaf sharply toothed
Hydrophyllaceae, p. 120.

- 230a. Creeping plant of the Pine Barrens, almost moss-like, with minute leaves crowded and overlapping on the stem; flowers white or pink *Diapensiaceae*, p. 113.
- 230b. Climbing or scrambling or trailing vines—231.
- 230c. Plants neither creeping nor scrambling nor climbing—233.
- 231a. Corolla bell-shaped, or funnel-form, or tubular below and spreading above—232.
- 231b. Corolla saucer-shaped or wheel-shaped
1b, in *Solanaceae*, p. 131.
- 232a. Flowers about 1 cm. long 3b, in *Campanulaceae*, p. 147.
- 232b. Flowers 2 cm. or more long or wide *Convolvulaceae*, p. 118.
- 233a. Flowers blue, in dense involucre heads
2a, in *Campanulaceae*, p. 147.
- 233b. Flowers not in heads—234.
- 234a. Ovary superior, visible inside the calyx when the corolla is removed—235.
- 234b. Ovary inferior, not visible within the calyx, but appearing as a swelling below the calyx at the summit of the flower-stalk
Campanulaceae, p. 146.
- 235a. Ovary 1 and not deeply lobed—236.
- 235b. Ovary deeply 4-lobed, appearing almost like 4 separate ovaries, best seen in the oldest flowers or in the fruit
Boraginaceae, p. 121.
- 236a. Some or all of the filaments hairy—237.
- 236b. None of the filaments hairy—238.
- 237a. Leaves entire or toothed 1a, in *Scrophulariaceae*, p. 133.
- 237b. Leaves lobed
Hydrophyllaceae, p. 120.
- 238a. Flowers 1 cm. wide or wider, solitary or in loose clusters
Solanaceae, p. 131.
- 238b. Flowers 5 mm. wide or less, in one-sided racemes
13a, in *Boraginaceae*, p. 122.
- 239a. Leaves simple *Ericaceae*, p. 109.
- 239b. Leaves compound with 3 leaflets *Oxalidaceae*, p. 86.
- 240a. Petals 4—241.
- 240b. Petals 5—245.
- 240c. Petals 6—261.
- 241a. Stamens 6—242.

241b. Stamens 8—243.

241c. Stamens about 11

1a, in *Capparidaceae*, p. 69.

241d. Stamens 16 or more

Papaveraceae, p. 62.

242a. Stamens at least 25 mm. long, protruding far beyond the corolla

1b, in *Capparidaceae*, p. 69.

242b. Stamens shorter, barely protruding from the corolla or concealed within it

Cruciferae, p. 63.

243a. Style 1, possibly with several stigmas—244.

243b. Styles and ovaries each 4

Crassulaceae, p. 70.

244a. Trailing plant with leaves about 1 cm. long

15a, in *Ericaceae*, p. 110.

244b. Erect or spreading plants with larger leaves

Onagraceae, p. 102.

245a. Stamens 5—246.

245b. Stamens 6—10—251.

245c. Stamens more than 10—258.

246a. Leaves entire or toothed or shallowly lobed—247.

246b. Leaves compound or very deeply lobed—249.

247a. Flowers single on each plant, white

2b, in *Saxifragaceae*, p. 71.

247b. Flowers in umbels or heads

Umbelliferae, p. 105.

247c. Flowers in panicles or loose open clusters—248.

248a. Leaves entire, linear or nearly linear

Linaceae, p. 86.

248b. Leaves shallowly lobed, almost round

6a, in *Saxifragaceae*, p. 71.

249a. Flowers in a terminal spike or raceme; leaflets toothed

33b, in *Rosaceae*, p. 76.

249b. Flowers solitary or in small clusters in the axils of the leaves

66b, in *Leguminosae*, p. 85.

249c. Flowers in umbels terminating the stem or its branches—250.

250a. Flowers pink

Geraniaceae, p. 87.

250b. Flowers white or yellow, or rarely with a few colored ones mixed with them

Umbelliferae, p. 105.

251a. Leaves entire or toothed—252.

251b. Leaves lobed or divided, but not truly compound—254.

251c. Leaves compound with 3 leaflets—255.

251d. Leaves pinnately compound with many leaflets—257.

- 252a. Prostrate plants with sessile yellow flowers from the axils of the leaves or the forks of the stem
1b, in *Portulacaceae*, p. 56.
- 252b. Erect or spreading or matted plants with flowers in terminal clusters—253.
- 253a. Ovary 1; style 1
11b, in *Ericaceae*, p. 110.
- 253b. Ovary 1; styles 2
3a, in *Saxifragaceae*, p. 71.
- 253c. Ovaries 5; styles 5
1b, in *Crassulaceae*, p. 70.
- 254a. Flowers white, in racemes
6b, in *Saxifragaceae*, p. 71.
- 254b. Flowers pink to purple, in small umbels
Geraniaceae, p. 87.
- 255a. Leaflets reverse-heart-shaped; flowers yellow
Oxalidaceae, p. 86.
- 255b. Leaflets not reverse-heart-shaped—256.
- 256a. Pistils 5
46a, in *Rosaceae*, p. 77.
- 256b. Pistils very many
28b, in *Rosaceae*, p. 75.
- 257a. Leaflets toothed; flowers in a slender spike-like terminal raceme
33b, in *Rosaceae*, p. 76.
- 257b. Leaflets entire; flowers in axillary clusters or axillary racemes
65, in *Leguminosae*, p. 85.
- 258a. Stamens united by their filaments into a tube surrounding the several styles
Malvaceae, p. 95.
- 258b. Stamens separate from each other—259.
- 259a. Leaves with stipules; ovaries 2 to many; stamens attached at the edge of the calyx-tube
Rosaceae, p. 72.
- 259b. Leaves without stipules; stamens attached close to the base of the ovary—260.
- 260a. Ovary 1; flowers yellow; leaves small, crowded and often overlapping
2a, in *Cistaceae*, p. 98.
- 260b. Ovaries several or many
Ranunculaceae, p. 57.
- 261a. Vines with lobed leaves and white flowers
Cucurbitaceae, p. 146.
- 261b. Erect herbs with ternately compound leaves and yellow flowers
1c, in *Berberidaceae*, p. 62.

VI. Special Key to Vines

- 1a. Climbing by tendrils, which either twine around the support or attach themselves to it by hold-fasts at the end (Twining stems are never considered as tendrils) —2.
- 1b. Climbing by a twining stem —3.
- 1c. Climbing by rootlets which are produced along the side of the stem and cling to the support; leaves compound —18.
- 1d. Reclining on other plants and supported by small hooked prickles along the stem —19.
- 1e. Trailing over bushes or on the ground, without any definite means of support —22.
 - 2a. Tendrils produced at the end of the compound leaves (Vetch, Beach Pea, Marsh Pea) 1b, in Leguminosae, p. 78.
 - 2b. Tendrils formed by the petiole of the leaf, which twines about the support; leaves compound —3.
 - 2c. Tendrils produced from the stipules of the leaf, in pairs, one on each side of the base of the petiole; leaves simple and entire —5.
 - 2d. Tendrils produced directly from the stem at or opposite the base of a leaf; leaves or leaflets toothed or lobed —6.
- 3a. Leaves alternate, thrice-pinnate (Climbing Fumitory) 2a, in Fumariaceae, p. 63.
- 3b. Leaves opposite —4.
 - 4a. Flowers pale blue, 5-10 cm. wide (Mountain Clematis) 32a, in Ranunculaceae, p. 60.
 - 4b. Flowers white, about 2 cm. wide (Virgin's Bower) 33a, in Ranunculaceae, p. 60.
- 5a. Stems shrubby, usually thorny (Greenbrier) 4, in Liliaceae, p. 27.
- 5b. Stems herbaceous, not thorny (Carrion Flower) 3, in Liliaceae, p. 27.
- 6a. Stems woody —7.
- 6b. Stems herbaceous (Bur Cucumber, Wild Cucumber) Cucurbitaceae, p. 146.
- 7a. Leaves compound with 5 leaflets (Virginia Creeper) 2, in Vitaceae, p. 94.
- 7b. Leaves simple (Grape) 3, in Vitaceae, p. 94.
- 8a. Leaves none; stems slender, yellow or brown (Dodder) 6, in Convolvulaceae, p. 119.

- 8b. Leaves opposite or whorled—9.
- 8c. Leaves alternate and compound—12.
- 8d. Leaves alternate and simple—13.
- 9a. Flowers axillary—10.
- 9b. Flowers in terminal clusters—11.
 - 10a. Flowers white to pink, fading yellow, in axillary pairs (Japanese Honeysuckle) 6a, in *Caprifoliaceae*, p. 144.
 - 10b. Flowers dark purple, in axillary clusters (Black Swallowwort) 1a, in *Asclepiadaceae*, p. 117.
 - 10c. Flowers greenish, without colored petals, in axillary clusters; stem bristly (Hop) 7a, in *Urticaceae*, p. 44.
- 11a. Uppermost pair of leaves connate at base below the flower-clusters (Honeysuckle) 7, in *Caprifoliaceae*, p. 144.
- 11b. Uppermost pair of leaves separate and petioled (Climbing Hemp-weed) 74a, in *Compositae*, p. 159.
- 12a. Flowers regular; petals united at base; stamens 5 (Bittersweet) 1b, in *Solanaceae*, p. 131.
- 12b. Flowers irregular, shaped like a sweet pea; stamens 10 1c, in *Leguminosae*, p. 78.
- 13a. Stems woody—14.
- 13b. Stems herbaceous—15.
 - 14a. Leaves either 5-lobed or entire, the petiole attached to the lower surface (peltate), not to the margin (Moonseed) *Menispermaceae*, p. 61.
 - 14b. Leaves toothed, the petiole attached to the margin (Bittersweet) 1a, in *Celastraceae*, p. 92.
- 15a. Each flower 1 cm. broad or more; stamens 5—16.
- 15b. Each flower much less than 1 cm. wide, white, greenish, or yellowish—17.
- 15c. Flowers none; a twining fern with palmately lobed leaves 17a, in *Ferns and their Allies*, p. 3.
- 16a. Corolla deeply 5-cleft (Bittersweet) 1b, in *Solanaceae*, p. 131.
- 16b. Corolla funnel-form, barely lobed around the margin (Morning Glory, Bindweed) 2, in *Convolvulaceae*, p. 119.
- 17a. Leaves with a single prominent midvein (False Buckwheat, Black Bindweed) 31, in *Polygonaceae*, p. 49.
- 17b. Leaves heart-shaped, with 7-13 principal veins from the base (Wild Yam) *Dioscoreaceae*, p. 32.

- 18a. Leaflets 3; flowers small and greenish (Poison Ivy)
1a, in *Anacardiaceae*, p. 91.
- 18b. Leaflets numerous; flowers large, bright orange-red (Trumpet Creeper)
1a, in *Bignoniaceae*, p. 140.
- 19a. Leaves whorled (Bedstraw) —20.
- 19b. Leaves alternate —21.
- 20a. Leaves mostly in whorls of 8 16b, in *Rubiaceae*, p. 143.
- 20b. Leaves in whorls of 4 to 6 20b, in *Rubiaceae*, p. 143.
- 21a. Leaves lanceolate to nearly linear, not lobed at the base (Marsh Bellflower)
3b, in *Campanulaceae*, p. 147.
- 21b. Leaves arrow-shaped or halberd-shaped, with 2 basal lobes (Tear-thumb)
30, in *Polygonaceae*, p. 49.
- 22a. Leaves opposite —23.
- 22b. Leaves alternate —24.
- 23a. Flowers blue, solitary in the axils of the leaves (Periwinkle)
1a, in *Apocynaceae*, p. 117.
- 23b. Flowers white to pink, fading yellow, in axillary pairs (Japanese Honeysuckle)
6a, in *Caprifoliaceae*, p. 144.
- 24a. Leaves not more than 2 cm. long; stamens 8 or 10 (Cranberry)
9, in *Ericaceae*, p. 110.
- 24b. Many of the leaves more than 3 cm. long; stamens 5 —25.
- 25a. Stems woody (Matrimony Vine) 1a, in *Solanaceae*, p. 131.
- 25b. Stems herbaceous (Bittersweet) 1b, in *Solanaceae*, p. 131.

Ferns and their Allies

The ferns and their relatives differ from flowering plants in the absence of true flowers and seeds. Reproduction is effected by microscopic spores which are produced within small bodies called sporangia. The sporangia are borne singly or in clusters on various parts of the plant. In ordinary ferns they form brown dots on the back or at the margin of the leaves; in the horsetail and most club-mosses they appear in dense spikes at the end of the stems; in some ferns they are borne on specialized leaves quite unlike the ordinary foliage leaves. Ferns and their allies in the vicinity of New York belong to nine different families, which are distinguished from each other by characters not always easy to observe. In the key below the families are not separated. While ferns may often be recognized by their leaf characters alone, an unknown fern can be satisfactorily identified only when bearing spores.

1a. Floating plants —2.

1b. Marsh plants or submerged aquatics with a basal rosette of linear grass-like leaves which bear the sporangia at their base —3.

1c. Land plants, often growing in swamps or wet places, but never floating or submerged. In one species the leaves are linear, but the sporangia are borne at the tip —4.

2a. Leaves rounded, nearly separate, rough above, 10–15 mm. long
Salvinia, *Salvinia natans*.

2b. Leaves minute, overlapping on the small branched stems
Azolla, *Azolla caroliniana*.

3. Quillwort, the genus *Isoetes*. Several species have been reported from our region, all of them small, rare, and not often observed. The separation of the species is difficult and requires careful, often microscopic study.

4a. Leaves none —6.

4b. Each individual leaf arising from the ground, very narrowly linear and often curled or twisted (5–10 cm. high; rare plant of the Pine Barrens) *Curly Grass*, *Schizaea pusilla*.

4c. Each individual leaf small, rarely more than 10 mm. long

and usually much smaller, linear, needle-like or scale-like, produced in large numbers on a definite stem —5.

- 4d. Each individual leaf large, certainly more than 2 cm. long and usually very much larger, usually flat, and often compound or branched (ferns in the ordinary meaning of the word) —16.
- 5a. Stems conspicuously jointed, bearing at each joint a small short sheath terminated by 3 or more minute teeth which represent the leaves —6.
- 5b. Stems not jointed, the short leaves not reduced to mere teeth, usually crowded and often overlapping —9.
- 6a. Stem perennial, evergreen, harsh to the touch, unbranched or with a few tough wiry branches; fruiting spikes terminal, sharp-pointed (5-10 dm. high)
Scouring Rush, Equisetum hyemale.
- 6b. Stem annual, usually rather soft, either unbranched or with numerous branches; fruiting spike soft and blunt —7.
- 7a. Stem simple or sparingly branched, the main stem with very thin and unbroken walls and with a central cavity four-fifths of the total diameter (5-15 dm. tall)
Scouring Rush, Equisetum fluviatile.
- 7b. Sterile stem freely branched, the central cavity one-third to two-thirds of the whole diameter, the walls with longitudinal air-spaces —8.
- 8a. Lateral branches of the sterile stems straight or ascending (1-4 dm. high)
Horsetail, Equisetum arvense.
- 8b. Lateral branches curved downward (2-5 dm. high)
Horsetail, Equisetum sylvaticum.
- 9a. Sporangia produced at the base of green leaves which are practically similar in size and color to those of the stem —10.
- 9b. Sporangia produced at the base of specialized yellowish leaves which are quite unlike the ordinary foliage leaves (Club Moss) —13.
- 10a. Foliage leaves less than 3 mm. long (stems freely branched, spreading or creeping) (Selaginella) —11.
- 10b. Foliage leaves 5 mm. long or more (some or all stems erect, 1-3 dm. high) (Club Moss) —12.
- 11a. Foliage leaves ascending or appressed to the stem, overlapping each other
Selaginella, Selaginella rupestris.

11b. Foliage leaves spreading, not overlapping

Selaginella, Selaginella apus.

- 12a. Leaves arranged in zones, alternately long and short; sporangia at the base of ordinary leaves, usually absent from the uppermost and therefore not forming a terminal spike

Club Moss, Lycopodium lucidulum.

- 12b. Foliage leaves uniform in length; sporangia at the base of the uppermost leaves only, forming a terminal spike

Club Moss, Lycopodium alopecuroides.

- 13a. Fruiting spikes sessile or nearly so at the summit of the leafy stems (1-3 dm. high) *Club Moss, Lycopodium obscurum.*

- 13b. Fruiting spikes borne on slender scaly stalks which terminate leafy stems —14.

- 13c. Fruiting spikes borne on slender scaly stalks (1-2 dm. high), which arise directly from the underground parts

Club Moss, Lycopodium carolinianum.

- 14a. Leaves of the sterile branches in 5 or more rows; stems widely creeping on the surface of the ground, with ascending or erect branches

Club Moss, Lycopodium clavatum.

- 14b. Leaves of the sterile branches in 4 rows; stems creeping beneath the surface, with erect branches 1-3 dm. high, including the spikes —15.

- 15a. Creeping stems deep in the ground; aerial branches usually less than 2 mm. wide *Club Moss, Lycopodium tristachyum.*

- 15b. Creeping stems near the surface of the ground; aerial branches generally 2-4 mm. wide

Club Moss, Lycopodium complanatum.

- 16a. Fruiting leaves, or fruiting parts of the leaves, very unlike the sterile in size or shape or both —17.

- 16b. Fruiting leaves much like the sterile ones in size and shape, or sometimes a trifle smaller or narrower —29.

17a. Plants twining or climbing

Climbing Fern, Lygodium palmatum.

17b. Plants not climbing or twining —18.

- 18a. Fruiting leaves and sterile leaves completely separate from each other to the very base of the plant —19.

- 18b. Part of each fruiting leaf sterile, sometimes appearing like a lateral leaf and a terminal fruiting portion —21.

19a. Sterile leaves pinnatifid, the lateral divisions all connected along the midvein —20.

19b. Sterile leaves pinnately compound, the lateral divisions separate from each other and themselves pinnatifid

Cinnamon Fern, *Osmunda cinnamomea*.

20a. Fruiting leaves very short, with nearly globular berry-like segments, very unlike the sterile ones

Sensitive Fern, *Onoclea sensibilis*.

20b. Fruiting leaves and sterile leaves both expanded and flat, the sterile merely much narrower than the fertile

Chain Fern, *Woodwardia areolata*.

21a. Leaf single on each plant, the sterile portion appearing lateral and the fertile portion terminal —22.

21b. Leaves several in a cluster, a part only of each leaf fertile and the remainder sterile, or some leaves entirely sterile (5-15 dm. high) —23.

22a. Sterile part of the leaf simple, entire, ovate or elliptic (5-20 cm. high)

Adder's Tongue, *Ophioglossum vulgatum*.

22b. Sterile part of the leaf compound or deeply lobed —23.

23a. Sterile part of the leaf sessile or nearly so, the stalk none or less than 1 cm. long (1-6 dm. high) —24.

23b. Sterile part of the leaf with a stalk 2 cm. long or longer (5-30 cm. high) —27.

24a. Sterile part of the leaf broadly triangular in outline, ternately decompose, with very numerous segments (often 50 or more)

Rattlesnake Fern, *Botrychium virginianum*.

24b. Sterile part of the leaf once-pinnate or rarely twice-pinnate, with few (3-20) segments (5-20 cm. high) (Grape Fern) —25.

25a. Veins of each leaf-segment forking from near the base; segments rounded or obovate

Grape Fern, *Botrychium simplex*.

25b. Veins of each leaf-segment forking also well above the base, or even beyond the middle —26.

26a. Lobes of the leaf lanceolate and acute

Grape Fern, *Botrychium lanceolatum*.

26b. Lobes of the leaf ovate and obtuse

Grape Fern, *Botrychium ramosum*.

27a. Smallest divisions of the sterile leaf acute and 2-3 times as long as wide

Grape Fern, *Botrychium obliquum*.

- 27b. Smallest divisions of the sterile leaf obtuse, not more than twice as long as wide **Grape Fern, Botrychium ternatum.**
- 28a. Leaves with the fertile portion at the upper end
Royal Fern, Osmunda regalis.
- 28b. Leaves with the fertile portion near the middle, the two ends sterile
Interrupted Fern, Osmunda Claytoniana.
- 29a. Sporangia produced at the margin of the leaf and covered when young by its reflexed margin —30.
- 29b. Sporangia produced at the margin or on the back of the leaf but not covered by a part of the margin —33.
- 30a. Sporangia produced in separate spots, each covered by a separate portion of the margin; leaf pinnately compound, its stalk divided into 2 near the top and each part producing pinnae along its upper side (3-6 dm. high)
Maidenhair, Adiantum pedatum.
- 30b. Sporangia produced continuously along the margin of the leaf-segments —31.
- 31a. Leaves growing singly, triangular in outline, the stalk branched at the top into 3 and each division bipinnate (5-10 dm. high)
Bracken, Pteris aquilina.
- 31b. Leaves growing in clusters, pinnate or bipinnate (1-3 dm. high) —32.
- 32a. Leaves hairy **Lip Fern, Cheilanthes lanosa.**
- 32b. Leaves smooth **Cliff-brake, Cryptogramma Stelleri.**
- 33a. Each cluster of sporangia (termed a sorus; plural, sori) oblong or elongate and sometimes curved —34.
- 33b. Sori nearly or quite round —41.
- 34a. Sori borne parallel with and close to the midvein (5-10 dm. high, in marshes) (Chain Fern) —35.
- 34b. Sori borne at an angle to the midvein —36.
- 35a. Divisions of the fertile leaf less than half as wide as the corresponding divisions of the sterile ones
Chain Fern, Woodwardia areolata.
- 35b. Divisions of the sterile and fertile leaves about alike in width
Chain Fern, Woodwardia virginica.
- 36a. Leaves lanceolate, entire, 1-4 dm. long, often taking root at the long slender tip
Walking Leaf Fern, Camptosorus rhizophyllus.
- 36b. Leaves compound or lobed (Spleenwort) —37.

- 37a. Tall ferns, the leaves usually 5-10 dm. long; sori more or less curved —38.
- 37b. Low ferns, the leaves rarely more than 3 dm. long; sori nearly or quite straight —39.
- 38a. Lateral pinnae pinnatifid, their segments minutely toothed
Spleenwort, *Asplenium acrostichoides*.
- 38b. Lateral pinnae pinnate, their segments sharply toothed or pinnatifid
Lady Fern, *Asplenium Filix-femina*.
- 39a. Leaves once-pinnate, lanceolate to linear in general outline —40.
- 39b. Leaves twice-pinnate or thrice-pinnate, ovate or triangular in general outline
Spleenwort, *Asplenium Ruta-muraria*.
- 40a. Lower pinnae with a distinct lobe on the upper margin at the base
Spleenwort, *Asplenium platyneuron*.
- 40b. Lower pinnae not lobed at base
Spleenwort, *Asplenium Trichomanes*.
- 41a. Sori covered when young, and often partly covered when old, by a special membrane called the indusium —42.
- 41b. Sori without an indusium —54.
- 42a. Indusium attached at the side or middle of the sorus —43.
- 42b. Indusium attached under the sorus and surrounding it like a cup —52.
- 43a. Indusium attached by its side to the leaf; leaves 2-3 times pinnate or pinnatifid (Bladder Fern) —44.
- 43b. Indusium attached by its center —45.
- 44a. Pinnae decurrent and forming a narrow wing along the rachis of the leaf; leaf 1-3 dm. long, exclusive of the stalk
Bladder Fern, *Cystopteris fragilis*.
- 44b. Pinnae not decurrent along the rachis; leaves 3-6 dm. long, exclusive of the stalk, often bearing bulblets in the axils of the pinnae
Bladder Fern, *Cystopteris bulbifera*.
- 45a. Leaves once-pinnate, the pinnae bristly on the margin and bearing a lobe on the upper side at the base; leaves 3-8 dm. long, including the stalk, lanceolate in outline
Christmas Fern, *Polystichum acrostichoides*.
- 45b. Leaves twice-pinnatifid or more finely divided, at least the lateral pinnae deeply toothed —46.
- 46a. Basal part of the leaf-stalk naked or with a few deciduous scales —47.

46b. Basal part of the leaf-stalk with numerous chaffy scales (Shield Fern) —49.

47a. Leaves broadest near the middle, the lowest pinnae gradually reduced in size (3-6 dm. high)

New York Fern, *Aspidium noveboracense*.

47b. Leaves broadest toward the base, the lowest pinnae scarcely or not at all reduced in size (3-10 dm. high) (Shield Fern) —48.

48a. Lateral veins of the fertile parts of the leaves mostly Y-shaped and bearing a sorus in the fork

Marsh Shield Fern, *Aspidium Thelypteris*.

48b. Lateral veins of the fertile parts of the leaves unbranched
Shield Fern, *Aspidium simulatum*.

49a. Sori marginal (leaves 4-10 dm. long, including stalk)

Shield Fern, *Aspidium marginale*.

49b. Sori not marginal —50.

50a. Leaves spinulose-toothed (3-6 dm. high)

Shield Fern, *Aspidium spinulosum*.

50b. Leaves not spinulose or bristly on the margin —51.

51a. Basal scales on the leaf-stalks dark chestnut-brown, firm in texture (5-10 dm. tall) **Shield Fern, *Aspidium Goldianum*.**

51b. Basal scales pale brown, dull, thin in texture (5-15 dm. high)
Shield Fern, *Aspidium cristatum*.

52a. Sori at or near the margin of the leaves; leaf-stalks not chaffy (4-6 dm. high)

Hay-scented Fern, *Dicksonia punctilobula*.

52b. Sori on the back of the leaf-segment —53.

53a. Leaf-stalk and lower side of leaves chaffy (1-4 dm. high)

Woodsia, *Woodsia ilvensis*.

53b. Leaf-stalk and leaves not chaffy (2-5 dm. high)

Woodsia, *Woodsia obtusa*.

54a. Lateral divisions of the leaf entire (leaves, with stalk, 1-2.5 dm. long) **Polypody, *Polypodium vulgare*.**

54b. Lateral divisions of the leaf deeply toothed or pinnatifid —55.

55a. Lateral pinnae all sessile —56.

55b. At least the lower lateral pinnae on distinct stalks; leaves broadly triangular, 1-2 dm. long

Oak Fern, *Phegopteris Dryopteris*.

56a. Leaves lanceolate in general outline —53.

56b. Leaves triangular in general outline, 1-3 dm. long, exclusive of the stalk (Beech Fern) —57.

57a. Leaves, excluding the stalk, longer than broad

Beech Fern, *Phegopteris polypodioides*.

57b. Leaves, excluding the stalk, broader than long

Beech Fern, *Phegopteris hexagonoptera*.

Flowering Plants

TAXACEAE, the Yew Family

Shrubs, often with ascending stems; leaves linear, evergreen; flowers minute, axillary, solitary, without petals, the sterile consisting of a few stamens, the fertile of a single ovule which ripens into a red berry.

1. Leaves alternate, sharp, 1-2 cm. long, on very short petioles (5-15 dm. tall; spring) Ground Hemlock, *Taxus canadensis*.

PINACEAE, the Pine Family

Trees or shrubs, with needle-like or scale-like, mostly evergreen leaves; flowers in catkins, monoecious or dioecious, without petals, the fertile catkins ripening into cones (berries in one genus), bearing a pair of seeds at the base of each cone-scale.

- 1a. Leaves numerous, deciduous in winter, narrowly linear, on short, stout, spur-like lateral branches; cones ovoid, 1-2 cm. long, with about 10-15 rounded cone-scales Tamarack, *Larix laricina*.
 1b. Leaves evergreen, in bundles of 2 to 5, surrounded by a delicate sheath at base (Pine) —2.
 1c. Leaves evergreen, solitary and scattered on the stem —4
 1d. Leaves evergreen, actually opposite or whorled, when carefully examined —5.
 2a. Leaves in bundles of 5, 8-12 cm. long; cones 10-15 cm. long, the scales thin at the top, without prickles
 White Pine, *Pinus Strobus*.
 2b. Leaves in bundles of 2 or 3; cone-scales thickened at the end and bearing a prickly spine on the back —3.
 3a. Leaves in bundles of 2, 4-7 cm. long and less than 2 mm. wide; spines of the cone 2-3 mm. long

Scrub Pine, *Pinus virginiana*.

- 3b. Leaves in bundles of 2 or 3, 7-12 cm. long, less than 2 mm. wide; spines of the cone weak, 1 mm. long or less

Yellow Pine, *Pinus echinata*.

- 3c. Leaves in bundles of 3, stiff, mostly 6-12 cm. long and 2-3 mm. wide; spines of the cone stout and recurved

Pitch Pine, *Pinus rigida*.

- 4a. Leaves 4-sided in cross-section, on all sides of the twig, 10-15 mm. long; cones ovoid, 2-4 cm. long **Red Spruce, *Picea rubra*.**

- 4b. Leaves flat, whitened in 2 lines underneath, 12-18 mm. long; cones ovoid, 15-25 mm. long **Hemlock, *Tsuga canadensis*.**

- 5a. Leaves individually minute, of two kinds alternating on each twig, the one kind flat, the other folded lengthwise; fruit a cone —6.

- 5b. Leaves on each twig alike, although different forms of leaves may sometimes be found on the same tree; fruit blue and berry-like —7.

- 6a. Branchlets very slender, scarcely flattened, the leaves often with a small gland on the back; cones globose, bluish, 6-10 mm. in diameter **White Cedar, *Chamaecyparis thyoides*.**

- 6b. Branchlets strongly flattened, forming a soft twig, the leaves without glands; cones ellipsoid, about 10 mm. long

Arbor Vitae, *Thuja occidentalis*.

- 7a. Leaves opposite, sometimes appressed, sometimes spreading

Red Cedar, *Juniperus virginiana*.

- 7b. Leaves in whorls of 3, awl-shaped and sharp (Juniper) —8.

- 8a. Erect shrub or small tree **Juniper, *Juniperus communis*.**

- 8b. Decumbent shrub forming large mats, rarely over 1 m. high **Juniper, *Juniperus communis* var. *depressa*.**

TYPHACEAE, the Cat-tail Family

Erect plants with linear leaves and terminal cylindrical spikes of brown flowers, the staminate ones above, the pistillate below; true petals none (marsh plants 1-2 m. tall; summer) (Cat-tail).

- 1a. Staminate and pistillate portions of the flower-spike contiguous, the latter 2.5 cm. in diameter **Cat-tail, *Typha latifolia*.**

- 1b. Staminate and pistillate portions of the spike separated by a short interval of stem, the pistillate 2 cm. or less in diameter

Cat-tail, *Typha angustifolia*.

SPARGANIACEAE, the Bur-reed Family

Marsh or aquatic plants with submerged, floating, or emersed, grass-like leaves and spherical heads of inconspicuous flowers, the petals reduced to a few chaffy scales; pistillate and staminate flowers in separate heads (stems 5-15 dm. long or high; summer) (Bur-reed).

- 1a. Pistillate flowers (not the pistillate heads of flowers) sessile; achene (seed) obovoid, rounded at the summit to a small sharp beak Bur-reed, *Sparganium eurycarpum*.
- 1b. Pistillate flowers with a very short pedicel; achene tapering to both ends —2.
- 2a. Beak of the fruit 2-4 mm. long Bur-reed, *Sparganium americanum*.
- 2b. Beak of the fruit 5-7 mm. long Bur-reed, *Sparganium lucidum*.

NAJADACEAE, the Pondweed Family

Aquatic plants with submerged or floating leaves; flowers minute, but sometimes in spikes and then more conspicuous; perianth either none, or of four parts only (summer).

- 1a. Leaves opposite or whorled —2.
- 1b. Leaves alternate —3.
- 2a. Leaves thread-like, 3-8 cm. long Horned Pondweed, *Zannichellia palustris*.
- 2b. Leaves linear, minutely toothed, abruptly dilated at the base, 3 cm. long or less (Naiad) —5.
- 2c. Leaves entire, not abruptly dilated at base —6.
- 3a. In salt or brackish water —4.
- 3b. In fresh water (Pondweed) —6.
- 4a. Leaves less than 1 mm. wide Sea Grass, *Ruppia maritima*.
- 4b. Leaves 2-8 mm. wide, very long Eel Grass, *Zostera marina*.
- 5a. Leaf-sheaths merely widened, ovate or rounded Naiad, *Najas flexilis*.
- 5b. Leaf-sheaths with prominent lobes projecting forward Naiad, *Najas gracillima*.
- 6. The Pondweeds, belonging to the genus *Potamogeton*, are represented in this region by about 16 species, many of which are rare and seldom collected. The identification of pondweeds is difficult and should not be attempted without the aid of a

Manual and the use of a good magnifying glass. Probably the most conspicuous species is *Potamogeton natans*, with floating elliptical leaves 5-10 cm. long.

JUNCAGINACEAE, the Arrow Grass Family

Marsh plants, with linear leaves and inconspicuous flowers in racemes or slender spikes, the 3 greenish or white petals and the 3 sepals nearly alike; stamens 3 or 6.

1a. Leaves all basal; flowers in a spike; flowering stem 2-6 dm. high (in salt marshes, summer) Arrow Grass, *Triglochin maritima*.

1b. Leaves on the stem; flowers in a raceme; stems 1-3 dm. high (in bogs, summer) *Scheuchzeria*, *Scheuchzeria palustris*.

ALISMACEAE, the Water Plantain Family

Aquatic or marsh plants; leaves all basal, sometimes floating or submerged; flowers white, in panicles or whorled clusters; sepals 3, green; petals 3; stamens 6 or more; pistils several or many (summer).

1a. Leaves arrow-shaped, with 2 basal lobes —2.

1b. Leaves linear to ovate, without basal lobes —6.

2a. Basal lobes of the leaf triangular in shape —3.

2b. Basal lobes of the leaf linear (Arrow-head) —4.

3a. Flower-clusters rising higher than the leaves (2-10 dm. high)

Arrow-head, *Sagittaria latifolia*.

3b. Flower-cluster shorter than the leaves, seldom more than 15 cm. high —7b.

4a. Beak of the achene at right angles to the body —3a.

4b. Beak of the achene erect or nearly so —5.

5a. Filaments about as long as the anthers

Arrow-head, *Sagittaria Engelmanniana*.

5b. Filaments much shorter than the anthers

Arrow-head, *Sagittaria heterophylla*.

6a. Flowers numerous, in a large, freely branched panicle (3-10 dm. high) Water Plantain, *Alisma Plantago-aquatica*.

6b. Flowers in small whorls, mostly of 3 flowers each, along an unbranched axis, or in a single terminal umbel —7.

7a. Flowers all perfect and alike (1-2 dm. high)

Water Plantain, *Echinodorus tenellus*.

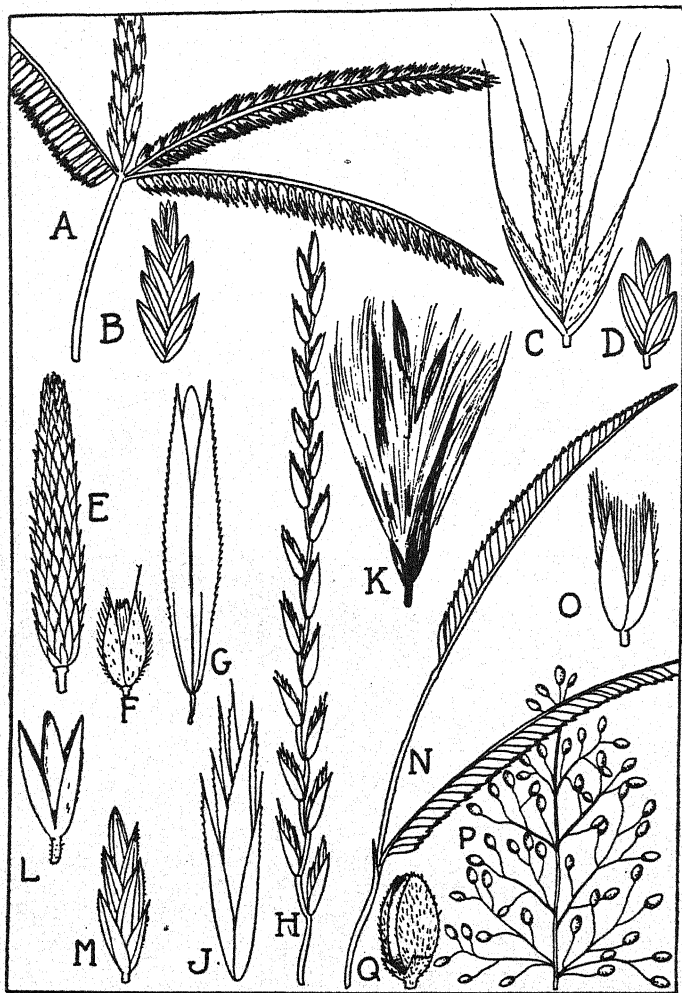


FIG. 17. Typical grasses. Flower-clusters about natural size; individual spikelets 4 times natural size. A, B. *Eleusine indica*; C. *Bromus tectorum*; D. *Glyceria nervata*; E, F. *Alopecurus geniculatus*; G. *Ammophila arenaria*; H, J. *Agropyron repens*; K. *Phragmites communis*; L. *Agrostis alba*; M. *Poa pratensis*; N. *Spartina patens*; O. *Calamagrostis canadensis*; P, Q. *Penicum implicatum*.

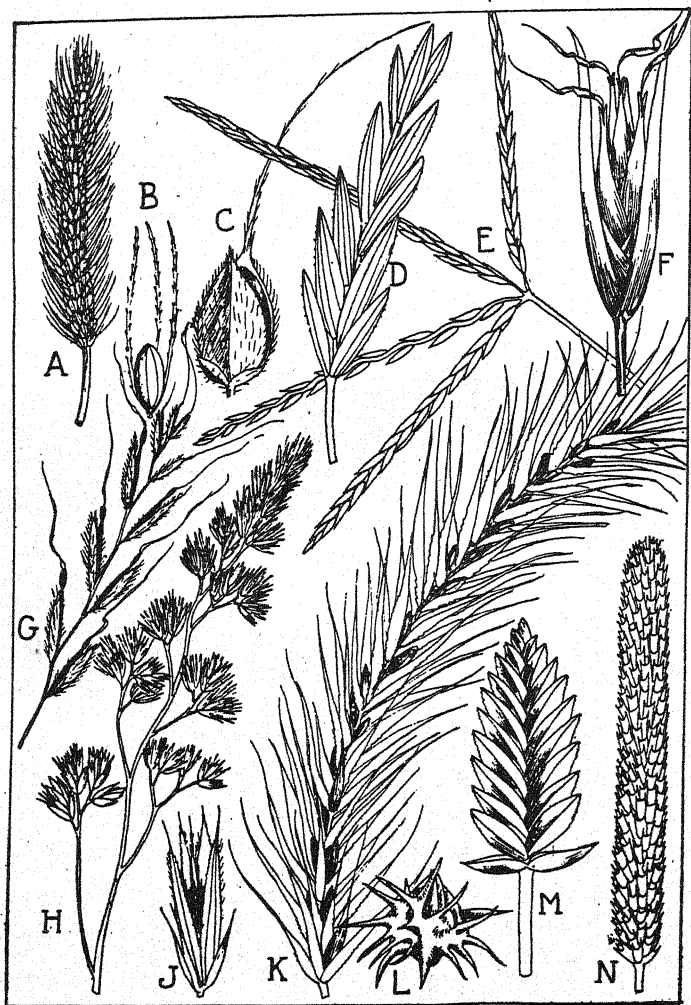


FIG. 18. Typical grasses. Flower-clusters about natural size; individual spikelets 4 times natural size. A, B. *Setaria viridis*; C. *Echinochloa crusgalli*; D. *Festuca elatior*; E. *Digitaria sanguinalis*; F. *Danthonia spicata*; G. *Andropogon scoparius*; H, J. *Dactylis glomerata*; K. *Elymus canadensis*; L. *Cenchrus carolinianus*; M. *Eragrostis megastachya*; N. *Phleum pratense*.

the axil of each lemma, and usually concealed by it, is a smaller bract, the palea, and between the lemma and the palea is a single flower without perianth. The number of flowers in a spikelet is therefore normally equal to the number of lemmas. The spikelets are grouped in racemes, spikes, or panicles of various sizes.

In the following key, only the very commonest grasses of the vicinity are included. While any of them can probably be named correctly and quickly, it must be remembered that it is very easy to try to use the key on some other grass which is not included in it and which will be either wrongly named or else not named at all. Before trying to use the key, isolate a single spikelet from the inflorescence, and determine whether it has 1 visible lemma, indicating 1 flower, or more than 1, indicating 2 or more flowers.

1a. Spikelets 1-flowered —2.

1b. Spikelets with 2 or more flowers —12.

2a. Spikelets grouped in dense solitary cylindrical or somewhat flattened terminal spikes —3.

2b. Spikelets grouped in panicles or in panicle or clustered spikes —6.

3a. Spikelets subtended by an ovoid spiny involucre, forming a bur —22.

3b. Spikelets subtended by 1 or more long spreading bristles, arising from their base (erect grasses 3-10 dm. high) —23.

3c. Spikelets and axis of the spike silky with soft hairs (growing in dense tufts, 5-10 dm. high)

Broom-sedge, *Andropogon scoparius*.

3d. Spikelets without conspicuous hairs, bristles, or spines —4.

4a. Plants of sand dunes along the ocean (spreading by root-stocks, 5-10 dm. tall) **Beach Grass, *Ammophila arenaria*.**

4b. Plants of very wet ground, especially low wet meadows (2-5 dm. high) **Floating Foxtail, *Alopecurus geniculatus*.**

4c. Plants of dry or moist soil, chiefly in fields, meadows, and along roadsides —5.

5a. Spikes very dense, exactly cylindrical; spikelets 3-4 mm. long (4-10 dm. high) **Timothy, *Phleum pratense*.**

5b. Spikes somewhat open and irregular; spikelets 8-10 mm. long (2-5 dm. high)

Sweet Vernal Grass, *Anthoxanthum odoratum*.

- 6a. Spikelets numerous, in long slender symmetrical spikes —7.
6b. Spikelets in panicles, racemes, or loose spikes —8.
- 7a. Spikelets without awns —24.
7b. Spikelets with conspicuous awns —25.
- 8a. Spikelets with awns 2 mm. long or more —26.
8b. Spikelets unawned, or with short inconspicuous awns only —9.
- 9a. Spikelets plump and compact, their bracts closely folded about each other —27.
9b. Spikelets loose and open, somewhat flattened, their 3 bracts ascending or spreading, and not closely folded about each other —10.
- 10a. Panicle strongly contracted or spike-like; plant of sand-dunes along the ocean —4a.
10b. Panicle spreading or slightly contracted only —11.
- 11a. Axis of the spikelets, above the glumes, beset with short bristles which are visible without dissection; marsh grass 6-12 dm. high
Blue-joint, Calamagrostis canadensis.
- 11b. Axis of the spikelet without bristles; plants of dry or moist soil —28.
- 12a. Spikelets arranged in a single row on one side of the axis, forming a slender 1-sided spike
Yard Grass, Eleusine indica.
- 12b. Spikelets alternating on opposite sides of the axis, forming a 2-rowed spike —13.
12c. Spikelets in panicles, never in definite rows —14.
- 13a. Spikelets in pairs at each joint, forming a dense spike —29.
13b. Spikelet single at each joint, forming a loose, open, or interrupted spike (erect, 4-8 dm. high)
Quack Grass, Agropyron repens.
- 14a. Glumes longer than the lemmas —15.
14b. Glumes shorter than the lemmas —16.
- 15a. Awn arising from the back of the lemma, below its tip
Oats, Avena sativa.
- 15b. Awn arising from between the terminal teeth of the lemma (3-5 dm. high)
Oat Grass, Danthonia spicata.
- 16a. Axis of the spikelet beset with conspicuous long hairs about equaling the lemmas; tall marsh grass 1-4 m. high
Reed, Phragmites communis.
- 16b. Spikelets without conspicuous hairs —17.

- 17a. Spikelets sessile or nearly so, in dense one-sided clusters at the end of the panicle-branches (4-6 dm. high)

Orchard Grass, *Dactylis glomerata*.

- 17b. Spikelets distinctly panicle —18.

18a. Lemmas, exclusive of the awn when present, 8 mm. long or more —30.

18b. Lemmas, exclusive of the awn when present, 6 mm. long or less —19.

- 19a. Lemmas with 5-9 sharp conspicuous nerves from base to apex —31.

- 19b. Lemmas with 3-5 inconspicuous veins —20.

20a. Spikelets with 2-4 lemmas —32.

20b. Spikelets with 5 or more lemmas —21.

- 21a. Flowering stems tufted and decumbent at the base —33.

- 21b. Flowering stems erect —34.

22. The genus *Cenchrus* (Sandbur) has two species in the region, of which *C. carolinianus* has a bur less than 1 cm. in diameter, and *C. tribuloides* has a bur well over that size. Both have spreading or ascending stems 3-8 dm. long.

23. The genus *Setaria* (Foxtail Grass). *S. imberbis* is a perennial with a creeping rootstock; the others are annuals. *S. glauca* has several bristles at the base of each spikelet, while *S. viridis*, *S. verticillata*, and *S. italica* have only 1 to 3. The latter four species are all common weeds.

24. The genus *Digitaria* (Crab Grass) has about three species in the vicinity, of which *D. sanguinalis* is the commonest. They are all weeds of gardens and lawns with several slender spikes spreading from the summit of the stem.

25. The genus *Spartina* (Marsh Grass) includes four species, all tall grasses 1-2 m. high, mostly growing in dense patches in salt marshes.

26. The genus *Echinochloa* (Barnyard Grass) is best represented by the common weed *E. crusgalli* (4-10 dm. high); *E. Walteri* is a taller plant with longer awns, growing in swamps.

27. The genus *Panicum*, collectively known as Panic Grass, is represented around New York by at least forty species, which differ greatly in habit, stature, size and shape of leaves, and size of the panicle. The identification of most of the species is a matter of considerable difficulty.

28. The genus *Agrostis*, or Bent Grass, has a few species in the vicinity, of which the commonest is the Red-top, *Agrostis alba*, of lawns and meadows.
29. The genus *Elymus* (Wild Rye) has three species common in the region, of which *E. canadensis* is generally the most abundant.
30. The genus *Bromus* (Brome Grass) is represented by half a dozen or more weeds, most of which are to be found in waste ground, or along railroads, or near factories. *B. secalinus* (Cheat) is sometimes a bad weed in fields.
31. The genus *Glyceria* (Manna Grass) has 11 species in the region. Most of them are found in swamps and marshes.
32. The genus *Poa*, with about 6 common species, includes such well-known grasses as the common Blue Grass of lawns (*P. pratensis*), the Canadian Blue Grass (*P. compressa*), distinguished by its flat stems, and the Spear Grass (*P. annua*), a tufted annual weed 2-10 cm. high of gardens and moist soil.
33. The genus *Eragrostis* (Love Grass), has about 4 common species, of which the best known is *E. megastachya*, a common weed in gardens and lawns.
34. The genus *Festuca* (Fescue Grass) includes the very slender *F. octoflora*, the wiry *F. ovina*, sometimes a weed in lawns, and the taller meadow grass, *F. elatior*.

CYPERACEAE, the Sedge Family

Grass-like or rush-like plants, either leafless or with linear leaves; in the latter case the base of the leaf sheaths the stem and forms a closed tube around it; flowers very small, without calyx or corolla, in the axils of green or chaffy bracts, mostly in summer or autumn. More than 200 species are known to grow in the vicinity of New York.

The identification of sedges depends chiefly on the shape of the fruit, which is a small, flat or 3-angled achene, on the presence or absence of bristles surrounding the achene, and on the size and structure of the spikelets. As in the Grass Family, the spikelet consists of few to several small bracts bearing flowers in their axils. There is usually little difference between the lower and the upper bracts and all of them are usually called scales. Sedges can not be identified well when in flower. Their study should be postponed until the achenes are ripe, but not so long that the achenes have all fallen out

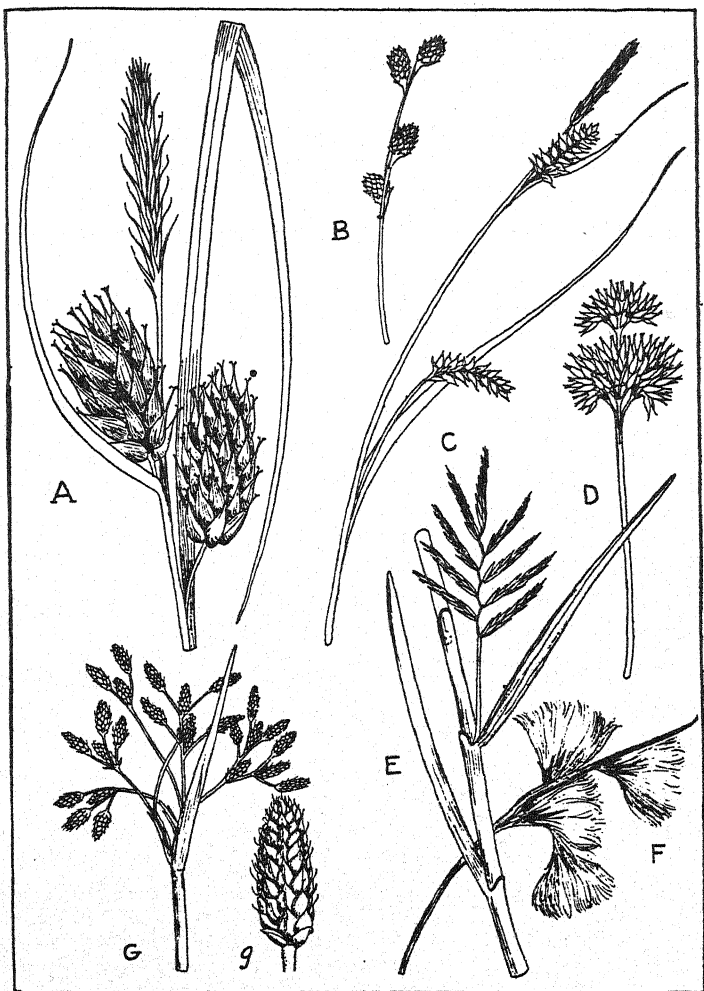


FIG. 19. Typical sedges. Fig. D about natural size; the others considerably reduced. A. *Carex lupulina*; B. *Carex straminea*; C. *Carex laxiflora*; D. *Eriophorum alba*; E. *Dulichium arundinaceum*; F. *Eriophorum viridi-carinatum*; G. *Scirpus validus*.

of the spikelets. Very careful study with a Manual and a good lens will be necessary for accurate results.

In the following key, only the commonest genera and a few of the common species are mentioned. Before starting with the key, notice first the arrangement of the scales in a spikelet, whether in two rows or on all sides of the axis; second, carefully isolate an achene and see whether it has bristles surrounding it from the base, or a beak on its apex, and whether it is flattened or 3-angled.

- 1a. Achenes completely enclosed within a sac (the perigynium), sometimes with the remains of the style protruding through a minute opening at the apex —10.
- 1b. Achenes not enclosed within a perigynium; spikelets all alike —2.
 - 2a. Stem leafless, bearing 1 or more spikelets at or near the top —3.
 - 2b. Stems leafy —4.
- 3a. Spikelet one only, erect at the very summit of the stem —11.
- 3b. Spikelets few or several, lateral near the summit of the stem —12.
 - 4a. Scales of the spikelet in 2 rows —5.
 - 4b. Scales of the spikelet on all sides of the axis —6.
- 5a. Flower-clusters terminal —13.
- 5b. Flower-clusters axillary along the side of the stem —14.
 - 6a. Achene with a terminal beak —15.
 - 6b. Achene without a terminal beak —7.
- 7a. Bristles present, more or less surrounding the achene —8.
- 7b. Bristles around the achene none —9.
 - 8a. Bristles very many, silky, more than 1 cm. long —16.
 - 8b. Bristles few, scarcely silky, mostly brown, less than 1 cm. long —17.
- 9a. Spikelets in loose panicle clusters —18.
- 9b. Spikelets in close head-like clusters —19.
- 10. The genus *Carex*, or Sedge, has more than 100 species in this region, growing in all kinds of situations, but most abundant in open swamps or marshes. In about a third of the species the spikelets are all alike; *C. vulpinoidea* and *C. straminea* are common examples of this group. In all the rest the spikelets are either staminate or pistillate. Here a few have flattened achenes, such as *C. crinita* of marshes. The rest have 3-angled achenes. *C. pennsylvanica* is one of our earliest flowering



FIG. 20. Typical sedges. Fig. F twice natural size; figs. B. and D about natural size; A, C, and E. somewhat reduced. A. *Cyperus strigosus*; B. *Cladium mariscoides*; C. *Eleocharis obtusa*; D. *Fimbristylis autumnalis*; E, F. *Scirpus cyperinus*.

plants, blooming in upland woods in April. *C. laxiflora*, a delicate plant with closely fitting perigynia, is common in moist shady places. The most conspicuous members of the genus grow in marshes or swamps and have large inflated perigynia, such as *C. hystericina*, *C. comosa*, *C. lupulina*, and *C. intumescens*. The collection and careful study of our many species of *Carex* is recommended.

11. *Eleocharis*, the Spike Rush, has about a dozen species. Two common ones are *E. obtusa*, an annual with fibrous roots, and *E. palustris*, perennial from creeping rootstocks.
12. *Scirpus*, the Bulrush, has about a dozen species. *S. validus*, the Great Bulrush, is very abundant in quiet water; it is leafless with a round stem. *S. americanus*, the Three-square, grows in shallow water or sandy shores and is leafless with a triangular stem. For other species of leafy *Scirpus*, see No. 17, below.
13. *Cyperus*, the Galingale, has about 16 species in our region. They are coarse weedy plants, with a branching inflorescence subtended by a number of foliage leaves. *C. esculentus* and *C. strigosus* are common species.
14. *Dulichium arundinaceum*, the Dulichium, is our only species. It is abundant in bogs.
15. *Rhynchospora*, the Beak Rush, has only a few species here, but several others in southern New Jersey. Our commonest one is *R. alba*, growing in bogs, with whitish spikelets.
16. *Eriophorum*, the Cotton Grass, is a northern genus, represented here by about 4 species. *E. viridi-carinatum* has bright-white bristles; *E. virginicum* has brownish bristles. All grow in bogs.
17. *Scirpus*, the Wool Grass, has about a dozen species. Some of them are leafless and known as Bulrush, for which see 12, above. Wool Grasses have numerous long leaves at the base of the many-flowered inflorescence. In *S. atrovirens* the bristles are about as long as the achene; in *S. cyperinus* they are much longer and give the spikelets a woolly appearance.
18. *Fimbristylis*, which has no accepted English name, has a single common species, *F. autumnalis*, a tufted plant of moist soil.
19. *Cladium*, the Twig Rush, has a single species, *C. mariscoides*, a common coarse sedge of marshes.

ARACEAE, the Arum Family

Individual flowers small, crowded on a fleshy spadix to form a conspicuous spike or head, which is usually surrounded by a green or colored spathe; leaves large and often net-veined.

1a. Leaves compound (3-8 dm. high; spring) —2.

1b. Leaves simple, or absent at the flowering season —3.

2a. Leaflets 3; the blunt spadix overarched by the green or purple spathe
Indian Turnip, *Arisaema triphyllum*.

2b. Leaflets 7-11; spadix long and slender, projecting beyond the green spathe
Dragon Root, *Arisaema Dracontium*.

3a. Leaves linear, sword-shaped; spathe none, the spadix lateral near the summit of the stem (5-15 dm. high) (early summer)

Sweet Flag, *Acorus Calamus*.

3b. Leaves arrow-shaped; spathe green (2-4 dm. high; early summer)

Arrow Arum, *Peltandra virginica*.

3c. Leaves elliptical to ovate or heart-shaped (or absent at the flowering season) —4.

4a. Spathe green, mottled with purplish-brown, produced at or partly beneath the surface of the ground (earliest spring)

Skunk Cabbage, *Symplocarpus foetidus*.

4b. Spathe white; leaves heart-shaped (2-3 dm. high; early summer)

Water Arum, *Calla palustris*.

4c. Spathe none; flowers bright yellow; leaves elliptical, floating (early summer)

Golden Club, *Orontium aquaticum*.

LEMNACEAE, the Duckweed Family

Minute leafless plants floating on quiet water; stems flat and rounded to linear, or football-shaped; flowers exceedingly small and seldom seen, in late summer.

1a. Roots several from each rounded plant (plants 3-5 mm. long, oval)
Duckweed, *Spirodela polyrrhiza*.

1b. Root single from each rounded plant —2.

1c. Roots none; plants thick, ovoid, less than 2 mm. long

Wolffia, *Wolffia columbiana*.

2a. Segments of the plant oblong, narrowed at the base, and remaining connected
Duckweed, *Lemna trisulca*.

- 2b. Segments of the plant oblong to ovate, not narrowed at one end
 Duckweed, *Lemna minor*.
 2c. *Lemna perpusilla* and *Lemna valdiviana* are rarer species
 distinguished from *Lemna minor* by minute characters.

ERIOCAULACEAE, the Pipewort Family

Bog or marsh herbs, sometimes aquatic, with basal linear leaves and small, whitish or lead-colored flowers in small dense heads at the end of slender scapes.

- 1a. Scapes with 4-7 fine longitudinal ridges; leaves mostly 2-6 cm. long, sharp-pointed and about as long as the sheath which encloses the base of the scape

Pipewort, *Eriocaulon articulatum*.

- 1b. Scapes with 10-14 minute ridges; leaves mostly more than 6 cm. long; scapes often 3-10 dm. tall —2.

- 2a. Leaves sharp-pointed, much shorter than the sheaths of the scape

Pipewort, *Eriocaulon compressum*.

- 2b. Leaves blunt, much longer than the sheaths of the scape

Pipewort, *Eriocaulon decangulare*.

XYRIDACEAE, the Yellow-eyed Grass Family

Small herbs with linear basal leaves and erect flower-stalks bearing a head of yellow perfect flowers, in summer; petals 3; stamens 3.

- 1a. Leaves at least 10 mm. wide at the base (4-8 dm. high)

Yellow-eyed Grass, *Xyris Smalliana*.

- 1b. Leaves narrowly linear, less than 10 mm. wide at base —2.

- 2a. Stem thickened and bulbous at the base

Yellow-eyed Grass, *Xyris flexuosa*.

- 2b. Stem not bulbous at the base

Yellow-eyed Grass, *Xyris caroliniana*.

COMMELINACEAE, the Spiderwort Family

Leafy-stemmed herbs; flowers conspicuous, with 3 sepals, 3 blue petals, and 3 or 6 stamens, lasting but a single day; base of the leaves sheathing the stem.

- 1a. Stamens 6; petals all equal; leaves linear, usually 3 dm. long or more (3-10 dm. high; late spring)

Spiderwort, *Tradescantia virginiana*.

- 1b. Perfect stamens 3; sterile stamens 3; two of the petals much larger than the third; leaves lanceolate, 5-15 cm. long (3-6 dm. high, summer) (Day-flower) —2.
- 2a. Spathes surrounding the base of the flower-clusters separate at their base on the upper convex side
Day-flower, *Commelina communis*.
- 2b. Spathes more or less united at their base on the upper side
Day-flower, *Commelina erecta*.

PONTEDERIACEAE, the Pickerel-weed Family

Aquatic or marsh herbs, with 6 rather conspicuous petals and 3 or 6 stamens (summer).

- 1a. Flowers blue, irregular; stamens 6; leaves heart-shaped (3-10 dm. high)
Pickerel-weed, *Pontederia cordata*.
- 1b. Flowers regular; stamens 3 (Mud Plantain) —2.
- 2a. Leaves round or kidney-shaped, 15-40 mm. wide; flowers white or pale blue; stems creeping
Mud Plantain, *Heteranthera reniformis*.
- 2b. Leaves linear, submerged or floating; flowers yellow
Mud Plantain, *Heteranthera dubia*.

JUNACEAE, the Rush Family

Grass-like or rush-like plants, with inconspicuous greenish or brownish flowers, usually in conspicuous heads or clusters, with 3 chaffy or scale-like sepals and as many similar petals; stamens 3 or 6.

- 1a. Leaves hairy (1-4 dm. high; spring)
Wood Rush, *Luzula campestris* var. *multiflora*.
- 1b. Leaves and stem smooth (summer) (Rush). The identification of these plants is difficult and requires the use of a good lens; consultation of the Manual is recommended —2.
- 2a. Inflorescence appearing lateral near the summit of the stem; the single involucre leaf being erect and appearing like a prolongation of the stem —3.
- 2b. Inflorescence appearing terminal, the involucre leaf or leaves spreading at an angle from the stem —5.
- 3a. Sheaths at or near the base of the stem all leafless —4.
- 3b. Sheaths, or some of them, bearing leaves

Rush, *Juncus maritimus*.

- 4a. Stamens 3; plant chiefly of wet meadows
Rush, *Juncus effusus*.
- 4b. Stamens 6; plant chiefly of sandy shores
Rush, *Juncus balticus* var. *littoralis*.
- 5a. Leaves prominently partitioned or divided crosswise (easily felt by drawing a leaf lengthwise tightly through the fingers) —6.
- 5b. Leaves not partitioned crosswise —13.
- 6a. Stamens 6 —7.
- 6b. Stamens 3 —9.
- 7a. Flowers solitary or in pairs
Rush, *Juncus pelocarpus*.
- 7b. Flowers in several-flowered clusters —8.
- 8a. Heads of flowers spherical
Rush, *Juncus Torreyi*.
- 8b. Heads of flowers hemispherical
Rush, *Juncus articulatus*.
- 9a. Seeds 1 mm. long or more, with a slender appendage or tail at both ends —10.
- 9b. Seeds less than 1 mm. long, acute or blunt at the ends, but not tailed —11.
- 10a. Principal heads with 2-6 flowers.
Rush, *Juncus brevipendulus*.
- 10b. Principal heads with 10-30 flowers
Rush, *Juncus canadensis*.
- 11a. Flower-heads globose, the larger ones with 20-40 flowers
Rush, *Juncus scirpoides*.
- 11b. Flower-heads obconic, rarely with as many as 20 flowers —12.
- 12a. Flower-heads with only 2-7 flowers
Rush, *Juncus debilis*.
- 12b. Flower-heads mostly with 5-15 flowers
Rush, *Juncus acuminatus*.
- 13a. Flowers in true many-flowered heads on the branches of the inflorescence; 3 stamens —14.
- 13b. Flowers scattered singly or in pairs along the branches of the inflorescence; 6 stamens —15.
- 14a. Heads 2-20
Rush, *Juncus marginatus*.
- 14b. Heads 20 or more
Rush, *Juncus aristulatus*.
- 15a. Summit of the uppermost leaf-sheath located at a third or more of the height of the plant —16.
- 15b. Summit of the uppermost leaf-sheath at a lower position, so that the leaves appear mostly basal —17.
- 16a. Plant of salt marshes, 2-8 dm. high
Rush, *Juncus Gerardi*.
- 16b. Plant of inland situations, 1-2 dm. high
Rush, *Juncus bufonius*.

- 17a. Leaf-blades nearly or quite cylindrical, but channeled along one side —18.
- 17b. Leaf-blades actually flat, but sometimes rolled so as to appear cylindrical —19.
- 18a. The longest involucral leaf much longer (twice or nearly so) than the cluster of flowers **Rush, *Juncus Greenel.***
- 18b. The longest leaf of the involucre equaling or shorter than the inflorescence **Rush, *Juncus dichotomus.***
- 19a. Leaf-sheaths prolonged into vertical lobes beyond the base of the leaf-blade **Rush, *Juncus tenuis.***
- 19b. Leaf-sheaths merely rounded at the summit on each side —20.
- 20a. Longest involucral bracts longer than the flower-clusters —21.
- 20b. Even the longest bracts much shorter than the flower-clusters **Rush, *Juncus secundus.***
- 21a. Flowers yellowish-green **Rush, *Juncus Dudleyi.***
- 21b. Flowers brown **Rush, *Juncus dichotomus.***

LILIACEAE, the Lily Family

Herbs or climbing shrubs, with generally conspicuous flowers; sepals and petals each 3, nearly alike in size, shape, and color, or different in *Trillium* (see 14c below); stamens 6; ovary 3-celled, superior. In one species (*Maianthemum canadense*, see 29a below) there are 2 sepals, 2 petals and 4 stamens.

- 1a. Plants climbing by tendrils; flowers small, greenish-yellow, in stalked umbels (late spring or early summer) —2.
- 1b. Plants not climbing; tendrils none —3.
- 2a. Stem herbaceous, not thorny; flowers ill-scented (Carrion Flower) —3.
- 2b. Stem woody, usually thorny, at least on the branches; flowers not ill-scented (Green Brier) —4.
- 3a. Leaves ovate, not lobed **Carrion Flower, *Smilax herbacea.***
- 3b. Leaves with 2 broad low lateral lobes **Carrion Flower, *Smilax tamnifolia.***
- 4a. Leaves rounded or heart-shaped at base, not evergreen —5.
- 4b. Leaves narrowed at base, narrowly oblong to linear, evergreen, thick and leathery **Green Brier, *Smilax laurifolia.***
- 5a. Leaves green on both sides —6.
- 5b. Leaves grayish or glaucous beneath **Green Brier, *Smilax glauca.***

- 6a. Peduncle usually 5-15 mm. long and scarcely longer than the petiole —7.
- 6b. Peduncle usually 20-30 mm. long and much longer than the petiole
Green Brier, *Smilax hispida*.
- 7a. Berries black; branches round (a common species)
Green Brier, *Smilax rotundifolia*.
- 7b. Berries red; branches angled (Pine Barrens and southward)
Green Brier, *Smilax Walteri*.
- 8a. Flowers or flower-clusters lateral, axillary or apparently so —9.
- 8b. Flowers or flower-cluster terminal on the stem or arising directly from the ground on a scape —14.
- 9a. Leaves minute and scale-like, less than 2 cm. long (freely branched plants 8-15 dm. high; flowers greenish, about 5 mm. long, late spring or early summer)
Asparagus, *Asparagus officinalis*.
- 9b. Leaves broad and flat, more than 3 cm. long —10.
- 10a. The 6 petals and sepals united into a tube, white or greenish-white (leaves lanceolate to ovate-lanceolate; late spring) (Solomon's Seal) —11.
- 10b. The 6 petals and sepals separate from each other (3-7 dm. high) —12.
- 11a. Leaves minutely hairy beneath; filaments rough, attached at three-fourths the length of the perianth (3-8 dm. high; flowers about 10 mm. long)
Solomon's Seal, *Polygonatum biflorum*.
- 11b. Leaves smooth beneath; filaments smooth, attached at the middle of the perianth (5-15 dm. high; flowers about 15 mm. long)
Solomon's Seal, *Polygonatum commutatum*.
- 12a. Flowers purple, rose or greenish-white, about 1 cm. long (4-8 dm. high; leaves ovate-lanceolate; late spring or early summer) (Twisted-stalk) —13.
- 12b. Flowers yellow or greenish yellow (spring) (Bellwort) —22b.
- 13a. Flowers greenish white; leaves heart-shaped and clasping the stem, smooth
Twisted-stalk, *Streptopus amplexifolius*.
- 13b. Flowers purple or rose; leaves sessile, or barely heart-shaped and slightly clasping, their margins ciliate
Twisted-stalk, *Streptopus roseus*.

- 14a. Leaf none at flowering time; flowers white, 5 mm. long, in an umbel (1-3 dm. high; early summer; leaves oblanceolate, in early spring) **Wild Leek, *Allium tricoccum*.**
- 14b. Leaves 2 on each flowering plant, oblong, basal and opposite, the large nodding flower solitary (1-2 dm. high, petals 2-4 cm. long; spring) (Dog-tooth Violet) —15.
- 14c. Leaves 3, in a single whorl below the large solitary terminal flower, broadly ovate to obovate; petals and sepals colored differently (2-4 dm. high, spring) (Trillium or Wake Robin) —16.
- 14d. Leaves in 2 whorls, the lower of several, the upper of 3-5 leaves; flowers several, small, greenish yellow, about 15 mm. wide (3-6 dm. high, early summer)
Indian Cucumber-root, *Medeola virginiana*.
- 14e. Leaves either alternate, or in several whorls, or all basal, but in the latter case the flowers are several or many on each stem —18.
- 15a. Flowers yellow **Dog-tooth Violet, *Erythronium americanum*.**
- 15b. Flowers white or bluish-white
Dog-tooth Violet, *Erythronium albidum*.
- 16a. Ovary obtusely angled or lobed; petals acute, striped with purple at the base **Painted Trillium, *Trillium undulatum*.**
- 16b. Ovary with 6 distinct wing-like angles —17.
- 17a. Flower-stalk 3 cm. long or less, declined below the leaves; petals white or pink; ovary pale or white
Wake Robin, *Trillium cernuum*.
- 17b. Flower-stalk longer, held above the leaves; petals white or purple-red; ovary purple-red **Wake Robin, *Trillium erectum*.**
- 18a. Petals each more than 5 cm. long (flowers yellow to red, summer) —19.
- 18b. Petals each less than 3 cm. long —22.
- 19a. Leaves all or chiefly basal, very long and slender (10-15 dm. high) **Day Lily, *Hemerocallis fulva*.**
- 19b. Leaves principally on the stem, lanceolate, 3-15 cm. long (Lily) —20.
- 20a. Flowers erect (4-10 dm. high)
Wood Lily, *Lilium philadelphicum*.
- 20b. Flowers nodding (7-20 dm. high) —21.

- 21a. Petals and sepals strongly recurved; leaves smooth beneath; flower-buds 3-sided and somewhat triangular in cross section
Turk's-cap Lily, *Lilium superbum*.
- 21b. Petals and sepals half-recurved; leaves finely roughened on the margins and the veins beneath; flower-buds almost cylindrical in cross-section
Yellow Lily, *Lilium canadense*.
- 22a. Flowers in umbels, but possibly few in each umbel —23.
- 22b. Flowers several on each plant or few, but each one solitary at the end of a leafy branch (3-6 dm. high; flowers yellow or greenish yellow, 2-3 cm. long, in spring) (Bellwort) —26.
- 22c. Flowers in racemes, panicles, or irregular clusters —27.
- 23a. Plants with the odor of onions or garlic (leaves all or chiefly basal, linear; 2-8 dm. high; flowers small, in late spring and summer) —24.
- 23b. Plants without the odor of onions (leaves elliptical, all basal; flower-stalks 2-4 dm. high; late spring) (Clintonia) —25.
- 24a. Leaves flattened; flowers pink to white
Wild Onion, *Allium canadense*.
- 24b. Leaves cylindrical and hollow; flowers greenish to purple
Field Garlic, *Allium vineale*.
- 25a. Flowers more or less drooping, greenish yellow, nearly 2 cm. long
Clintonia, *Clintonia borealis*.
- 25b. Flowers erect, white, about 1 cm. long
Clintonia, *Clintonia umbellulata*.
- 26a. Leaves perfoliate
Bellwort, *Uvularia perfoliata*.
- 26b. Leaves sessile
Bellwort, *Oakesia sessilifolia*.
- 27a. Principal leaves on the stem, the basal ones either absent or no larger in size —28.
- 27b. Principal leaves all or chiefly basal, the stem-leaves either none or much smaller in size —32.
- 28a. Flowers in a raceme, white, less than 1 cm. wide —29.
- 28b. Flowers in a branching panicle (leaves elliptical to lanceolate) —31.
- 29a. Petals and sepals together 4; leaves usually only 2, ovate-lanceolate, heart-shaped at base (1-2 dm. high; early summer)
Wild Lily of the Valley, *Maianthemum canadense*.
- 29b. Petals and sepals together 6; leaves oblong to lanceolate, narrowed or obtuse at the sessile base (spring) (False Solomon's Seal) —30.

- 30a. Leaves 2 to 4, usually 3 (1-3 dm. high)
False Solomon's Seal, *Smilacina trifolia*.
- 30b. Leaves 5 to 12 (2-5 dm. high)
False Solomon's Seal, *Smilacina stellata*.
- 31a. Flowers white, less than 1 cm. wide (4-9 dm. high; spring)
False Solomon's Seal, *Smilacina racemosa*.
- 31b. Flowers greenish yellow, about 2 cm. wide (10-20 dm. high; summer)
False Hellebore, *Veratrum viride*.
- 32a. Flowers tubular or globose, 5-8 mm. long, 6-toothed at the tip—33.
- 32b. Flowers with petals nearly or quite separate from each other—34.
- 33a. Flowers blue, globose (1-3 dm. high; leaves linear; spring)
Grape Hyacinth, *Muscari botryoides*.
- 33b. Flowers yellowish white, tubular (5-9 dm. high; leaves lanceolate; summer)
Colic-root, *Aletis farinosa*.
- 34a. Flowers all perfect, with a single style (1-2 dm. high; leaves linear; flowers white, 3 cm. wide, striped with green on the back)
Star of Bethlehem, *Ornithogalum umbellatum*.
- 34b. Flowers all perfect, the ovary without a style (2-4 dm. high; leaves thread-like; raceme dense, 2-4 cm. long; flowers greenish yellow, about 5 mm. long, early summer)
Bog Asphodel, *Narthecium americanum*.
- 34c. Flowers perfect, the ovary with 3 styles—35.
- 34d. Flowers with either stamens or pistils, in the latter case, the ovary with 3 styles—35.
- 35a. Flowers in a branching panicle (summer)—36.
- 35b. Flowers in an unbranched raceme (leaves linear; flowers 5-10 mm. long)—38.
- 36a. Branches of the flower cluster smooth; leaves rarely more than 1 cm. wide (4-12 dm. high; flowers white or greenish white, 8 mm. wide)
***Zygadenus*, *Zygadenus leimanthoides*.**
- 36b. Branches of the flower cluster slightly hairy; principal leaves 2-5 cm. wide (7-15 dm. high; flowers greenish white or greenish yellow, 1-2 cm. wide) (Bunch-flower)—37.
- 37a. Expanded portion of each petal elliptical, entire
Bunch-flower, *Melanthium virginicum*.
- 37b. Expanded portion of each petal almost round, wavy-margined
Bunch-flower, *Melanthium latifolium*.

- 38a. None of the leaves more than 1 cm. wide (flowers white to greenish or yellowish, summer)—39.
- 38b. Some of the leaves certainly more than 1 cm. wide, and usually even 2-3 cm. wide—40.
- 39a. Pedicels of the individual flowers about 5 mm. long (3-8 dm. high) *Tofieldia, Tofieldia racemosa.*
- 39b. Pedicels of the individual flowers 2-3 cm. long (5-15 dm. high) *Turkey-beard, Xerophyllum asphodeloides.*
- 40a. Flowers purple (3-6 dm. high; spring) *Swamp Pink, Helonias bullata.*
- 40b. Flowers white (4-10 dm. high; summer)—41.
- 41a. Petals linear; flower with either stamens or pistil but not both *Blazing Star, Chamaelirium luteum.*
- 41b. Petals broad; flowers with both stamens and pistil *Fly Poison, Amianthium muscaetoxicum.*

HAEMODOBACEAE, the Bloodwort Family

Perianth divided into 6 parts, the sepals and petals about alike; stamens 3 or 6; ovary 3-celled, inferior or superior, with a single style; perennial herbs with linear leaves mostly near the base and smaller ones on the stem; flowers dull yellow, woolly, in a terminal cluster (3-6 dm. high; summer).

- 1a. Stamens 3 *Red-root, Lachnanthes tinctoria.*
- 1b. Stamens 6 *Lophiola, Lophiola aurea.*

DIOSCOREACEAE, the Yam Family

Twining herbs with net-veined leaves and small, greenish or white flowers in panicles or racemes; sepals and petals together 6, all alike; stamens 6; ovary 3-celled, inferior; styles 3.

1. Leaves ovate-cordate (summer) *Wild Yam, Dioscorea villosa.*

AMARYLLIDACEAE, the Amaryllis Family

Plants with linear basal leaves; sepals and petals together 6, all alike; stamens 6; ovary inferior.

1. Flowers yellow, 1 cm. wide (1-2 dm. high; spring) *Star Grass, Hypoxis hirsuta.*

IRIDACEAE, the Iris Family

Herbs, with 6-parted perianth, 3 stamens, and inferior ovary; leaves linear.

- 1a. Flowers 4 cm. wide or larger (5-12 dm. high) —2.
 1b. Flowers about 1 cm. wide (blue or white, from a spathe terminating a 2-edged stem 2-5 dm. high; spring and early summer) (Blue-eyed Grass) —4.
 2a. Flowers mottled orange and purple (summer)
 Blackberry Lily, *Belamcanda chinensis*.
 2b. Flowers bright yellow (late spring)
 Yellow Flag, *Iris pseudacorus*.
 2c. Flowers blue with yellow markings (late spring) (Blue Flag) —3.
 3a. Leaves 2-3 cm. wide **Blue Flag, *Iris versicolor*.**
 3b. Leaves 3-5 mm. wide **Blue Flag, *Iris prismatica*.**
 4a. Spathes sessile —5.
 4b. Spathes on long stalks —6.
 5a. Pedicels barely longer than the shorter of the 2 leaves composing the spathe **Blue-eyed Grass, *Sisyrinchium angustifolium*.**
 5b. Pedicels much longer than the shorter leaf of the spathe
 Blue-eyed Grass, *Sisyrinchium mucronatum*.
 6a. Stems surrounded at base by a tuft of numerous bristle-like fibers **Blue-eyed Grass, *Sisyrinchium arenicola*.**
 6b. Stems without bristle-like fibers at the base —7.
 7a. Spathes 10-15 mm. long
 Blue-eyed Grass, *Sisyrinchium atlanticum*.
 7b. Spathes 15-25 mm. long
 Blue-eyed Grass, *Sisyrinchium gramineum*.

ORCHIDACEAE, the Orchis Family

Herbs with irregular flowers, one petal, called the lip, differing from the other two petals in size and shape; ovary inferior; stamens 1 or 2, adherent to the style and not resembling ordinary stamens.

- 1a. Leaf one or none at flowering time —2.
 1b. Leaves all reduced to small scales without green color; stems brown, purple, or yellow (1-4 dm. high; summer) (Coral-root) —7.
 1c. Leaves a single pair, basal, or opposite on the stem, never alternate on the stem —8.
 1d. Leaves several, all basal —12.
 1e. Leaves 2 or more, on the stem, alternate or whorled —13.

- 2a. Flowers solitary, pink-purple (1-5 dm. high; early summer) —3.
 2b. Flowers 2, or more than 2 in a raceme —4.
 3a. With a lanceolate leaf near the middle of the stem —31a.
 3b. Scape leafless, but with 1-3 small bracts; the leaf, when developed, basal *Arethusa, Arethusa bulbosa*.
 4a. Flowers white or green, numerous, in a spike-like, twisted raceme (late summer or autumn) (Ladies' Tresses) —16.
 4b. Flowers not numerous, or not in a twisted raceme —5.
 5a. Flowers pink-purple, about 25 mm. long (3-5 dm. high; early summer) *Calopogon, Calopogon pulchellus*.
 5b. Flowers greenish white, minute, about 2 mm. long (1-2 dm. high; summer) *Adder's Mouth, Microstylis unifolia*.
 5c. Flowers greenish or yellowish and marked or tinged with purple, 6-15 mm. long (3-6 dm. high) —6.
 5d. Flowers greenish white, not marked with purple, with a curved spur (summer) —27b.
 6a. Flowers several or many in a long raceme, each with a slender spur 2 cm. long (summer) *Crane-fly Orchis, Tipularia discolor*.
 6b. Flowers few or several, without a spur (spring) *Putty Root, Aplectrum hyemale*.
 7a. Lip 3-lobed *Coral-root, Corallorrhiza maculata*.
 7b. Lip minutely toothed *Coral-root, Corallorrhiza odontorrhiza*.
 8a. Lip an inflated pouch about 4 cm. long —20a.
 8b. Lip not pouch-like and much smaller —9.
 9a. Flowers with spurs 15-25 mm. long —10.
 9b. Flowers without spurs (1-2 dm. high; late spring and early summer) (Tway-blade) —11.
 10a. Flowers purple or magenta, or with white markings (1-3 dm. high; late spring) *Showy Orchis, Orchis spectabilis*.
 10b. Flowers greenish or white or yellowish (2-6 dm. high; summer) (Rein Orchis) —29.
 11a. Lip about 10 mm. long, purple *Tway-blade, Liparis liliifolia*.
 11b. Lip about 5 mm. long, yellowish green *Tway-blade, Liparis Loeselii*.
 12a. Leaves prominently net-veined and marked with white, oval or ovate (1-5 dm. high; flowers whitish, hairy, summer) *Rattlesnake Plantain, Epipactis pubescens*.
 12b. Leaves not net-veined, not marked with white, usually lance-

- olate or linear; flowers in a twisted raceme (summer and autumn) (Ladies' Tresses) —14.
- 13a. Flowers in a spike-like, twisted raceme, small, yellowish or greenish white (summer and autumn) (Ladies' Tresses) —14.
- 13b. Flowers solitary or in clusters or racemes, but never in twisted racemes —19.
- 14a. Flowers in a single twisted vertical row —15.
- 14b. Flowers in several twisted rows —18.
- 15a. Basal leaves obovate to broadly lanceolate, or absent; lip less than 5 mm. long (late summer) —16.
- 15b. Basal leaves narrowly lanceolate to linear; lip 6-10 mm. long (summer) —17.
- 16a. Lip white, 2-3 mm. long (1-2 dm. high)
Ladies' Tresses, *Spiranthes Beckii*.
- 16b. Lip green with white margin, 4 mm. long (2-6 dm. high)
Ladies' Tresses, *Spiranthes gracilis*.
- 17a. Flowers yellowish (2-5 dm. high)
Ladies' Tresses, *Spiranthes vernalis*.
- 17b. Flowers white, or marked with green (3-7 dm. high)
Ladies' Tresses, *Spiranthes praecox*.
- 18a. Lip yellow (1-3 dm. high)
Ladies' Tresses, *Spiranthes lucida*.
- 18b. Lip white (1-5 dm. high; our commonest species)
Ladies' Tresses, *Spiranthes cernua*.
- 19a. Lip an inflated pouch 2-5 cm. long (Lady Slipper) —20.
- 19b. Lip not an inflated pouch —21.
- 20a. Lip pink; leaves 2 only (2-4 dm. high; spring)
Pink Lady Slipper, *Cypripedium acaule*.
- 20b. Lip yellow (3-8 dm. high; late spring)
Yellow Lady Slipper, *Cypripedium parviflorum*.
- 20c. Lip white (1-3 dm. high; late spring)
White Lady Slipper, *Cypripedium candidum*.
- 20d. Lip white with red markings; leaves several (4-8 dm. high; late spring)
Showy Lady Slipper, *Cypripedium hirsutum*.
- 21a. Flowers in terminal racemes, each with a spur (summer) —22.
- 21b. Flowers solitary, or in small clusters, or in racemes, but not with a spur —30.
- 22a. Flowers orange-yellow (2-8 dm. high) —23.

- 22b. Flowers pink-purple, the lip 3-lobed and fringed around the margin (2-8 dm. high) (Fringed Orchis) —25.
- 22c. Flowers white, showy, the lip about 1 cm. long, fringed around the margin but not 3-lobed (3-8 dm. high)
Fringed Orchis, Habenaria blephariglottis.
- 22d. Flowers greenish or greenish white —26.
- 23a. Lip of the corolla fringed around the margin (Fringed Orchis) —24.
- 23b. Lip of the corolla slightly toothed, but not fringed at the margin
Rein Orchis, Habenaria integra.
- 24a. Spur less than 1 cm. long
Fringed Orchis, Habenaria cristata.
- 24b. Spur 2-3 cm. long
Fringed Orchis, Habenaria ciliaris.
- 25a. Lip about 2 cm. wide
Fringed Orchis, Habenaria fimbriata.
- 25b. Lip about 1 cm. wide
Fringed Orchis, Habenaria psycodes.
- 26a. Lip entire at the margin (3-9 dm. high) (Rein Orchis) —28.
- 26b. Lip with 2 or 3 small teeth at its apex (2-6 dm. high) (Rein Orchis) —27.
- 26c. Lip 3-lobed and fringed around the margin (3-6 dm. high)
Fringed Orchis, Habenaria lacera.
- 27a. Stem-leaves 3 or more
Rein Orchis, Habenaria bracteata.
- 27b. Stem-leaves 1 or 2
Rein Orchis, Habenaria clavellata.
- 28a. Lip lanceolate, tapering toward the apex
Rein Orchis, Habenaria hyperborea.
- 28b. Lip oblong, truncate at the apex
Rein Orchis, Habenaria flava.
- 29a. Flower-stalk with 1 or a few narrow bracts below the base of the flower-cluster; flowers greenish white
Rein Orchis, Habenaria orbiculata.
- 29b. Flowers with bracts only at the very base of the flower-cluster; flowers yellowish green
Rein Orchis, Habenaria Hookeri.
- 30a. Principal leaves basal, ovate or oval, net-veined, marked with white —18a.
- 30b. Principal leaves on the stem, in a whorl of 5 (2-3 dm. high; flowers purple and greenish yellow, late spring)
Whorled Pogonia, Pogonia verticillata.
- 30c. Principal leaves on the stem, alternate —31.
- 31a. Flower 1 and terminal, or rarely 2, pink-purple or white, in early summer (Snake Mouth) —32.

- 31b. Flowers 1-6, each solitary in the axil of a small leaf 1-2 cm. long (5-20 cm. high; flowers purple, summer)

Nodding Pogonia, *Pogonia trianthophora*.

- 31c. Flowers numerous in a terminal raceme (3-6 dm. high; flowers greenish yellow, tinged with purple)

False Hellebore, *Serapias Helleborine*.

- 32a. Lip fringed around its margin (2-3 dm. high)

Snake Mouth, *Pogonia ophioglossoides*.

- 32b. Lip minutely toothed but not fringed (3-5 dm. high)

Snake Mouth, *Pogonia divaricata*.

PIPERACEAE, the Pepper Family

Herbaceous plants with alternate entire leaves and flowers with neither calyx nor corolla.

1. Marsh plant with heart-shaped leaves and long slender spikes of small white flowers (5-12 dm. high; summer)

Lizard's Tail, *Saururus cernuus*.

SALICACEAE, the Willow Family

Trees or shrubs, with alternate simple leaves and dioecious flowers in catkins, appearing in early spring, mostly before the leaves.

- 1a. Leaves broadly ovate, heart-shaped, or round, less than twice as long as broad, on petioles 3 cm. long or longer (trees) —2.

- 1b. Leaves more than twice as long as broad, on petioles usually less than 2.5 cm. long (Willow, the genus *Salix*. For satisfactory identification both flowers and fruit are necessary, and they are never obtainable at the same time. Positive identification by leaf-character alone is usually impossible) (trees or shrubs) —5.

- 2a. Petioles strongly flattened laterally; leaves smooth beneath when full-grown (Aspen) —3.

- 2b. Petioles cylindrical or barely flattened; full-grown leaves hairy beneath, at least on the veins (Poplar) —4.

- 3a. Leaves coarsely toothed, the teeth about 1 cm. apart; terminal buds dull, about 3 mm. long

Large-toothed Aspen, *Populus grandidentata*.

- 3b. Leaves finely toothed, the teeth mostly 2-4 mm. apart; terminal buds shining, about 5 mm. long

Quaking Aspen, *Populus tremuloides*.

- 4a. Leaves coarsely sinuately toothed; escaped from cultivation near houses

White Poplar, *Populus alba*.

- 4b. Leaves finely toothed; native tree of swamps

Swamp Poplar, *Populus heterophylla*.

- 5a. Trees —6.

- 5b. Shrubs —9.

- 6a. Petioles without dark glands

Black Willow, *Salix nigra*.

- 6b. Petioles with dark glands —7.

- 7a. Leaves green beneath

Crack Willow, *Salix fragilis*.

- 7b. Leaves pale beneath —8.

- 8a. Branches and twigs conspicuously drooping

Weeping Willow, *Salix babylonica*.

- 8b. Branches and twigs not conspicuously drooping

White Willow, *Salix alba*.

- 9a. Shrubs of moist or wet ground, stream sides, and swamps —10.

- 9b. Shrubs of dry upland situations —14.

- 9c. Shrubs escaped from cultivation along roadsides and fence-rows —15.

- 10a. Leaves densely white-woolly beneath

Willow, *Salix candida*.

- 10b. Leaves shining above

Willow, *Salix lucida*.

- 10c. Leaves neither woolly nor shining —11.

- 11a. Leaves rounded at base

Willow, *Salix cordata*.

- 11b. Leaves acute at base —12.

- 12a. Leaves remotely toothed to nearly entire

Willow, *Salix discolor*.

- 12b. Leaves finely and closely toothed —13.

- 13a. Young leaves densely silky

Willow, *Salix sericea*.

- 13b. Young leaves thinly hairy

Willow, *Salix petiolaris*.

- 14a. Leaves about 3 times as long as broad

Willow, *Salix rostrata*.

- 14b. Leaves narrower, nearly sessile

Willow, *Salix tristis*.

- 14c. Leaves narrower, distinctly petioled

Willow, *Salix humilis*.

- 15a. Leaves oblanceolate, distinctly and finely toothed

Willow, *Salix purpurea*.

- 15b. Leaves narrowly lanceolate to linear, almost entire

Willow, *Salix viminalis*.

MYRICACEAE, the Sweet Gale Family

Shrubs with monoecious or dioecious flowers in catkins and aromatic foliage (spring).

- 1a. Leaves deeply pinnatifid or toothed, fern-like in appearance (3-8 dm. high) **Sweet Fern, *Myrica asplenifolia*.**
- 1b. Leaves merely toothed to entire, narrowly oblong or oblanceolate (5-20 dm. high) —2.
- 2a. Growing in dry upland soil **Bayberry, *Myrica carolinensis*.**
- 2b. Growing in swamps and along river-banks **Sweet Gale, *Myrica Gale*.**

JUGLANDACEAE, the Walnut Family

Trees with alternate, pinnately compound leaves; staminate flowers in catkins, in spring; fruit a nut, completely enveloped by a thick husk.

- 1a. Leaflets 11-23; pith of the twigs divided by partitions into separate chambers; husk of the rough nut not splitting lengthwise —2.
- 1b. Leaflets 5-11; pith not partitioned; husk of the smooth or angled nut splitting lengthwise (Hickory) —3
- 2a. Pith white or cream-color; bark of the trunk without flat ridges **Black Walnut, *Juglans nigra*.**
- 2b. Pith brown; bark with flat longitudinal ridges **Butternut, *Juglans cinerea*.**
- 3a. In summer, when leaves only are available —4.
- 3b. In autumn, when leaves and nuts are available —8.
- 4a. Bark of the trunk deeply furrowed or shaggy —5.
- 4b. Bark of the trunk close and nearly smooth, not deeply furrowed or shaggy —6.
- 5a. Twigs and leaves both hairy; buds densely hairy **Mocker-nut Hickory, *Carya alba*.**
- 5b. Twigs nearly smooth; leaves smooth above **Shag-bark Hickory, *Carya ovata*.**
- 6a. Leaves smooth beneath; buds greenish-brown —7.
- 6b. Leaves somewhat hairy beneath; buds orange or yellow **Bitter-nut Hickory, *Carya cordiformis*.**
- 7a. Twigs hairy **Small-fruited Hickory, *Carya microcarpa*.**
- 7b. Twigs smooth **Pig-nut Hickory, *Carya glabra*.**

- 8a. Nut sweet and edible, its husk easily splitting to the very base —9.
- 8b. Nut more or less bitter or unpleasant to the taste —11.
- 9a. Bark of the trunk shaggy, breaking loose in long strips attached at the middle only **Shag-bark Hickory, *Carya ovata*.**
- 9b. Bark of the trunk rough and furrowed, not breaking loose in long strips —10.
- 10a. Nut angled, with a very thick shell, about the size of an ordinary hickory-nut **Mocker-nut Hickory, *Carya alba*.**
- 10b. Nut not angled, with a thin shell, much smaller than an ordinary hickory-nut
 Small-fruited Hickory, *Carya microcarpa*.
- 11a. Terminal buds distinctly yellow or orange
 Bitter-nut Hickory, *Carya cordiformis*.
- 11b. Terminal buds greenish brown or gray
 Pig-nut Hickory, *Carya glabra*.

BETULACEAE, the Birch Family

Trees or shrubs with alternate simple leaves and small inconspicuous flowers, the staminate in catkins and the pistillate in catkins or small clusters (spring).

- 1a. Branches with numerous lateral dwarf branches, each crowded with leaf-scars and bearing 2 or 3 almost opposite, ovate to broadly ovate leaves and 1 terminal bud; trees (Birch) —2.
- 1b. Lateral dwarf branches not present, the leaves all obviously alternate and well separated —5.
- 2a. Bark chalky white, exfoliating in thin papery plates or scales
 White Birch, *Betula populifolia*.
- 2b. Bark yellowish brown to black —3.
- 3a. Twigs with the odor of wintergreen when crushed —4.
- 3b. Twigs not aromatic when crushed **Red Birch, *Betula nigra*.**
- 4a. Bark of trunk dark brown, not separating in layers
 Black Birch, *Betula lenta*.
- 4b. Bark of trunk yellowish gray, separating in thin layers
 Yellow Birch, *Betula lutea*.
- 5a. Tree or shrub, with smooth dark gray bark; trunk fluted with prominent longitudinal ridges; leaves ovate-lanceolate
 Hornbeam, *Carpinus caroliniana*.

- 5b. Trees or shrubs, the bark more or less roughened, but the trunk not fluted with longitudinal ridges —6.
- 6a. Fruit-clusters woody, persisting on the plant for a long time, and consequently visible during the summer; lateral buds stalked; pith 3-angled; leaves oval to obovate (Alder)—7.
- 6b. Fruit-clusters papery or herbaceous, dropping in late autumn —9.
- 7a. Leaves pale green or whitened beneath, doubly toothed (shrub 2-6 m. high) **Speckled Alder, *Alnus incana*.**
- 7b. Leaves green beneath, simply toothed —8.
- 8a. Twigs smooth or slightly hairy (shrub 2-6 dm. high) **Smooth Alder, *Alnus rugosa*.**
- 8b. Twigs glutinous, not hairy (tree) **European Alder, *Alnus vulgaris*.**
- 9a. Tree; fruit a cluster of bladder-like sacks each containing a small achene; leaves oblong-ovate **Ironwood, *Ostrya virginiana*.**
- 9b. Irregularly branched shrubs 1-3 m. high, fruit a nut within a close-fitting husk; leaves broadly ovate to nearly round (Hazel) —10.
- 10a. Husk of 2 broad bracts, almost separate and not much longer than the fruit; twigs often bristly **Hazel, *Corylus americana*.**
- 10b. Husk of united bracts, prolonged into a bristly beak much beyond the fruit; twigs not bristly **Beaked Hazel, *Corylus rostrata*.**

FAGACEAE, the Beech Family

Trees, or a few species shrubs, with alternate simple leaves and monoecious flowers, the staminate in slender catkins, the pistillate solitary or in small clusters; fruit a nut or acorn, wholly or partly enclosed in a bur or cup (flowers in spring).

- 1a. Leaves entire, except for a bristle at the very tip, oblong-lanceolate **Willow Oak, *Quercus phellos*.**
- 1b. Leaves crenate, toothed, or sinuate on the margin, not lobed —2.
- 1c. Leaves lobed, sometimes shallowly so, the point of each lobe tipped with a bristle (Black Oaks and their relatives. These oaks are variable in the form and size of their leaves and often puzzle even the experienced botanist.) —6.
- 1d. Leaves lobed, the end or points of the lobes rounded or obtuse, not tipped with bristles (White Oaks and their relatives) —12.

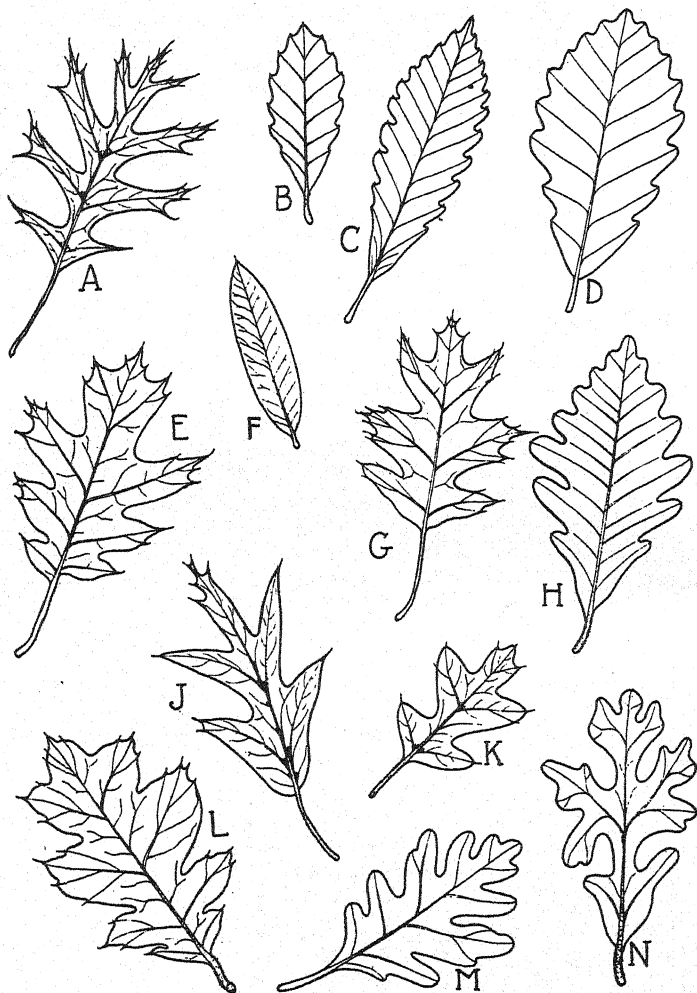


FIG. 21. Typical leaves of oak, about one-third natural size. A. *Quercus palustris*; B. *Q. prinoides*; C. *Q. Muhlenbergii*; D. *Q. Prinus*; E. *Q. rubra*; F. *Q. phellos*; G. *Q. coccinea*; H. *Q. bicolor*; J. *Q. falcata*; K. *Q. ilicifolia*; L. *Q. velutina*; M. *Q. alba*; N. *Q. stellata*.

- 2a. Bark smooth and gray, even on the oldest trunks; leaves ovate-oblong; nut three-cornered, wholly enclosed in a prickly bur

Beech, *Fagus grandifolia*.

- 2b. Bark of the trunk and older branches rough and furrowed —3.

- 3a. Pith 5-angled; fruit an acorn (Chestnut Oaks and their relatives) —4.

- 3b. Pith not 5-angled; fruit a rounded nut, enclosed in a prickly bur; leaves oblong-lanceolate, very sharply toothed

Chestnut, *Castanea dentata*.

- 4a. Leaves broadest at or near the middle with 8-13 coarse sharp teeth on each side; acorns sessile

Yellow Oak, *Quercus Muhlenbergii*.

- 4b. Leaves broadest well above the middle, with numerous blunt or rounded teeth on each side; acorns on a stalk nearly as long as the petiole

Chestnut Oak, *Quercus Prinus*.

- 4c. Leaves broadest above the middle, with 7 or fewer shallow or rounded teeth on each side —5.

- 5a. Large tree; leaves densely white-woolly beneath; acorn on a stalk 3-10 cm. long

Swamp White Oak, *Quercus bicolor*.

- 5b. Shrub; leaves thinly white-woolly beneath; acorn sessile or nearly so

Scrub Oak, *Quercus prinoides*.

- 6a. Leaves broadly obovate, entire below the middle, with a few (usually 3) shallow lobes at the summit

Black Jack Oak, *Quercus marilandica*.

- 6b. Leaves deeply lobed throughout their length —7.

- 7a. Acorn-cup saucer-shaped, shallow, covering less than a third of the acorn —8.

- 7b. Acorn-cup deeper, hemispherical or top-shaped, covering a third or more of the acorn —9.

- 8a. Length of the lateral leaf-lobes less than one-third of the total width of the leaf; acorn-cup 15-25 mm. wide

Red Oak, *Quercus rubra*.

- 8b. Length of the lateral leaf-lobes more than one-third the total width of the leaf; acorn-cup about 1 cm. in diameter

Pin Oak, *Quercus palustris*.

- 9a. Leaves green beneath —10.

- 9b. Leaves hairy and pale green or gray-green beneath —11.

- 10a. Inner bark of the trunk orange; leaves usually somewhat hairy beneath

Black Oak, *Quercus velutina*.

- 10b. Inner bark reddish; leaves smooth beneath
Scarlet Oak, *Quercus coccinea*.
- 11a. Leaf-lobes about as broad as long; a shrub, seldom more than
3 m. high Scrub Oak, *Quercus ilicifolia*.
- 11b. Leaf-lobes (at least the upper 3) much longer than wide; a tree
Spanish Oak, *Quercus falcata*.
- 12a. Mature leaves smooth and pale or whitish beneath
White Oak, *Quercus alba*.
- 12b. Mature leaves finely hairy beneath
Post Oak, *Quercus stellata*.

URTICACEAE, the Nettle Family

Herbs or trees, with small inconspicuous apetalous flowers.

- 1a. Trees or tall shrubs (spring) —2.
- 1b. Herbs with alternate leaves (flowers in axillary clusters, summer)
—6.
- 1c. Herbs with opposite leaves (flowers in axillary clusters, summer)
—7.
- 2a. Leaves broadly ovate to rotund in general outline, some of
them lobed (Mulberry) —3.
- 2b. Leaves oblong-ovate to lanceolate, merely toothed —4.
- 2c. Leaves ovate to oblong, entire; stems thorny
Osage Orange, *Maclura pomifera*.
- 3a. Leaves smooth above
White Mulberry, *Morus alba*.
- 3b. Leaves rough above
Red Mulberry, *Morus rubra*.
- 4a. Leaves thick, coarsely and doubly toothed, broadest near
the middle (Elm) —5.
- 4b. Leaves thin, simply toothed, broadest distinctly below the
middle Hackberry, *Celtis occidentalis*.
- 5a. Petioles and axillary buds smooth White Elm, *Ulmus americana*.
- 5b. Petioles and axillary buds hairy with rusty hairs
Slippery Elm, *Ulmus fulva*.
- 6a. Leaves 2-5 cm. long, oblong-lanceolate; stems finely hairy (1-4
dm. high) Pellitory, *Parietaria pennsylvanica*.
- 6b. Leaves 8-20 cm. long, ovate; stem armed with stinging hairs
(6-12 dm. high) Wood Nettle, *Laportea canadensis*.
- 7a. Twining plant; stem rough with reflexed hairs; leaves toothed
or cleft Hop, *Humulus Lupulus*.

- 7b. Erect; leaves palmately compound with several linear-lanceolate leaflets (1-3 m. high) **Hemp, Cannabis sativa.**
- 7c. Erect; leaves neither lobed nor compound —8.
- 8a. Stems armed with stinging hairs (Nettle) —9.
- 8b. Stems smooth or rough, but without stinging hairs (leaves ovate) —10.
- 9a. Leaves ovate, with a heart-shaped base (6-12 dm. high)
Nettle, Urtica dioica.
- 9b. Leaves lanceolate or ovate-lanceolate, rounded at base (7-20 dm. high) **Nettle, Urtica gracilis.**
- 10a. Stems smooth, almost translucent (1-5 dm. high)
Clearweed, Pilea pumila.
- 10b. Stems rough or roughish, opaque (4-10 dm. high)
False Nettle, Boehmeria cylindrica.

SANTALACEAE, the Sandalwood Family

Low herbs with alternate entire oblong leaves and apetalous flowers, the calyx corolla-like, 5-lobed; stamens 5.

1. Flowers greenish white, about 4 mm. long, in terminal clusters (1-4 dm. high; spring) **Toad-flax, Comandra umbellata.**

ARISTOLOCHACEAE, the Birthwort Family

Herbs, with apetalous greenish brown or reddish brown flowers, at or near the ground; calyx tubular or bell-shaped, 3-lobed or with 3 sepals; ovary inferior, 6-celled.

- 1a. Leaves alternate, on the stem, ovate-oblong, heart-shaped at base; flowers irregular, with a curved calyx, on a basal scaly branch (1-4 dm. high; summer)
Virginia Snakeroot, Aristolochia Serpentina.
- 1b. Leaves a single basal pair, broadly heart-shaped or kidney-shaped bearing 1 short-stalked flower between them (spring) (Wild Ginger) —2.
- 2a. Lobes of the sepals ending in a tubular portion 5-8 mm. long
Wild Ginger, Asarum canadense.
- 2b. Lobes of the sepals triangular, not tubular at the end
Wild Ginger, Asarum canadense var. reflexum.

POLYGONACEAE, the Buckwheat Family

Herbs with alternate entire leaves; stipules sheathing the stem above the base of each leaf; flowers small, green, white, or pink, without petals; sepals 4, 5, or 6, often petal-like in appearance; stamens 3-9; fruit a flat or 3-angled achene.

- 1a. Erect or ascending or prostrate or floating plants —2.
- 1b. Scrambling or climbing plants, clinging by sharp recurved prickles on the 4-angled stems (flowers pink or greenish; summer) (Tear-thumb) —30.
- 1c. Twining vines with triangular or heart-shaped leaves (flowers white or greenish; summer) —31.
- 2a. Sepals 6, the 3 inner ones much the larger, enlarging in fruit and surrounding the achene; flowers in panicles, green or slightly reddish —3.
- 2b. Sepals 4 or 5, all about the same size (occasionally flowers may be found with 6 sepals, but in such cases the flowers are not in panicles) (summer) —10.
- 3a. Leaves arrow-shaped or hastate, with 2 prominent basal lobes (Sorrel) —4.
- 3b. Leaves without basal lobes (late spring and summer) (Dock) —5.
- 4a. Leaf-lobes directed backward (3-10 dm. high; summer)
Green Sorrel, *Rumex Acetosa*.
- 4b. Leaf-lobes directed sideways (1-4 dm. high; spring and summer)
Red Sorrel, *Rumex Acetosella*.
- 5a. The projecting wings of the fruiting calyx (known as valves) with sharp slender teeth (lower leaves heart-shaped at base; 7-12 dm. high)
Bitter Dock, *Rumex obtusifolius*.
- 5b. Valves entire or finely dentate, but without sharp slender teeth (leaves oblong to lanceolate) —6.
- 6a. With grain-like tubercles on all 3 valves of the fruit —7.
- 6b. With grain-like tubercles on only one valve, or entirely lacking (7-15 dm. high)
Patience Dock, *Rumex Patientia*.
- 7a. Leaves flat or nearly so —8.
- 7b. Leaves with strongly crisped or wavy-curved margins —9.
- 8a. Pedicels of the fruit little if any longer than the valves (4-10 dm. high)
Pale Dock, *Rumex mexicanus*.
- 8b. Pedicels of the fruit several times longer than the valves (8-15 dm. long, often procumbent)

Swamp Dock, *Rumex verticillatus*.

- 9a. Lower leaves narrow or acuminate at base (1-3 m. high)
Great Dock, Rumex Brittanica.
- 9b. Lower leaves cordate or very obtuse at base (4-10 dm. high)
Curled Dock, Rumex crispus.
- 10a. Flowers inconspicuous, solitary in the axils or in small axillary clusters; leaves jointed at the base (Knotweed) —11.
- 10b. Flowers more or less conspicuous, in spikes or racemes which terminate the stems or branches or arise from the axils of the upper leaves —17.
- 11a. Stems prostrate or nearly so; sepals with white or pink margins (1-6 dm. long; leaves lanceolate to linear, 10-25 mm. long) —12.
- 11b. Stems erect or strongly ascending (2-8 dm. high) —13.
- 12a. Plant very glaucous or almost white, on sea beaches
Knotweed, Polygonum maritimum.
- 12b. Plant deep green or bluish green, a weed
Knotweed, Polygonum aviculare.
- 13a. Leaves strongly folded lengthwise, nearly linear, 2-5 cm. long
Knotweed, Polygonum tenue.
- 13b. Leaves flat —14.
- 14a. Flowers yellowish green or white; leaves 1.5-5 cm. long —15.
- 14b. Flowers pinkish, at least at the margin of the sepals; leaves linear or narrowly oblong, 1-4 cm. long
Knotweed, Polygonum prolificum.
- 15a. Leaves elliptical, obtuse
Knotweed, Polygonum erectum.
- 15b. Leaves lanceolate or linear, acute —16.
- 16a. Sepals 6
Knotweed, Polygonum ramosissimum.
- 16b. Sepals usually 5
Knotweed, Polygonum exsertum.
- 17a. Sepals 4; flowers in very long and slender, interrupted, spike-like racemes, greenish or pink (4-10 dm. high; leaves ovate)
Knotweed, Polygonum virginianum.
- 17b. Sepals 5; flowers in spikes or racemes —18.
- 18a. Leaves broadly triangular (3-8 dm. high; flowers white, fragrant)
Buckwheat, Fagopyrum esculentum.
- 18b. Leaves ovate, oblong, lanceolate, or linear —19.
- 19a. Flowers on slender pedicels, forming a loose raceme —20.
- 19b. Flowers sessile or nearly so, forming a spike or spike-like raceme —21.

- 20a. Leaves linear, jointed at the base (1-3 dm. high; flowers pink or white) **Jointweed, Polygonella articulata.**
- 20b. Leaves ovate or broadly oblong (1-3 m. high; flowers greenish white) **Japanese Knotweed, Polygonum cuspidatum.**
- 21a. Stipular sheaths at the base of the leaves with a fringe of hairs at their upper margin —22.
- 21b. Stipular sheaths not fringed at the margin (flowers white to pink) (Smartweed) —23.
- 22a. Stipular sheaths with spreading borders (flowers pink) —23.
- 22b. Stipular sheaths appressed to the stem; leaves lanceolate (Smartweed) —24.
- 23a. Leaves ovate, acuminate; stem erect, 1-2 m. high
Prince's Feather, Polygonum orientale.
- 23b. Leaves oblong, obtuse or somewhat acute; spreading or ascending plant of shallow water or wet soil
Water Smartweed, Polygonum amphibium var. Hartwrightii.
- 24a. Stalks of the spikes with short glandular hairs (5-15 dm. high; flowers purplish) **Smartweed, Polygonum Careyi.**
- 24b. Stalks not glandular (1-10 dm. high) —25.
- 25a. Sepals beset with minute black dots (flowers white, pink, or greenish) —26.
- 25b. Sepals not black-dotted, white, pink, or red —27.
- 26a. Spikes of flowers drooping or nodding at the tip; achene dull in color **Smartweed, Polygonum Hydropiper.**
- 26b. Spikes erect; achene smooth and shining
Smartweed, Polygonum acre.
- 27a. Stipular sheaths smooth; racemes short and compact, 1.5-5 cm. long; leaves usually with a dark spot near the base
Smartweed, Polygonum Persicaria.
- 27b. Stipular sheaths hairy; racemes long and open, 3-8 cm. long; leaves not dark-spotted
Smartweed, Polygonum hydropiperoides.
- 28a. Stem submerged in water with floating leaves, or creeping on muddy shores; racemes 1 or 2, short and stout; leaves obtuse or barely acute **Water Smartweed, Polygonum amphibium.**
- 28b. Stem erect, growing on land or in swamps; racemes slender; leaves acuminate —29.

- 29a. Racemes single or 2; leaves broadly ovate-lanceolate, about 3 times as long as wide (4-10 dm. high)

Smartweed, *Polygonum Muhlenbergii*.

- 29b. Racemes numerous, drooping or nodding at the tip (6-20 dm. high; leaves lanceolate)

Smartweed, *Polygonum lapathifolium*.

- 29c. Racemes numerous, erect; flower-stalks glandular-hairy (4-10 dm. high; leaves lanceolate)

Smartweed, *Polygonum pennsylvanicum*.

- 30a. Leaves narrowly oblong or lanceolate, arrow-shaped at base, the lobes pointing backward

Tear-thumb, *Polygonum sagittatum*.

- 30b. Leaves nearly as broad as long, the lobes at the base pointing sidewise

Tear-thumb, *Polygonum arifolium*.

- 31a. The 3 outer sepals becoming conspicuously winged in fruit (False Buckwheat) —32.

- 31b. The sepals all unchanged in fruit, except in size (Black Bindweed) —33.

- 32a. Wings of the fruit 1 cm. long or more, with flat, entire or toothed margins

False Buckwheat, *Polygonum dumetorum*.

- 32b. Wings of the fruit 5-7 mm. long, with wavy-curved margins

False Buckwheat, *Polygonum scandens*.

- 33a. Stipular sheath with a ring of bristles at its base

Black Bindweed, *Polygonum cilinode*.

- 33b. Stipular sheath without a ring of bristles

Black Bindweed, *Polygonum Convolvulus*.

CHENOPODIACEAE, the Goosefoot Family

Herbs, often weeds, with inconspicuous greenish or reddish flowers without petals, in summer; distinguished from the following family chiefly by the absence of sharp-pointed bracts among the flowers.

- 1a. Leaves reduced to minute scales only; soft fleshy-stemmed plants of salt-marshes and sea-shores (1-4 dm. high; flowers in terminal spikes) (Glasswort) —2.

- 1b. Leaves linear —4.

- 1c. Leaves deeply pinnately incised or lobed; foliage glandular-hairy and strongly scented —8.

- 1d. Leaves entire to heavily toothed, but not lobed or linear —9.

- 2a. Stems from a perennial woody rootstock, trailing or prostrate, at least at base **Glasswort, *Salicornia ambigua*.**
- 2b. Stems annual, erect or ascending —3.
- 3a. Leaf-scales sharply pointed **Glasswort, *Salicornia mucronata*.**
- 3b. Leaf-scales blunt-tipped **Glasswort, *Salicornia europaea*.**
- 4a. Leaves spiny-tipped (3-6 dm. high; flowers axillary) —5.
- 4b. Leaves not spiny at the tip —6.
- 5a. Native plant of sea-beaches **Saltwort, *Salsola Kali*.**
- 5b. Weed of fields and waste places
- Russian Thistle, *Salsola Kali* var. *tenuifolia*.**
- 6a. Leaves thick or nearly cylindrical; plants of salt-marshes; flowers axillary (Sea Blite) —7.
- 6b. Leaves flat; flowers in dense clusters, terminal or also in the upper axils (2-8 dm. high)
- Goosefoot, *Chenopodium leptophyllum*.**
- 7a. Foliage dark green (3-9 dm. high) **Sea Blite, *Suaeda linearis*.**
- 7b. Foliage pale green and glaucous (1-4 dm. high)
- Sea Blite, *Suaeda maritima*.**
- 8a. Stems prostrate (2-5 dm. long), only the branches ascending; flowers axillary, solitary or few
- Goosefoot, *Roubieva multifida*.**
- 8b. Stems erect or nearly so; flowers in little panicles from the upper axils and terminal (2-6 dm. high)
- Jerusalem Oak, *Chenopodium Botrys*.**
- 9a. Leaves entire, oblong, broadest at or above the middle; spreading plant of sea-beaches (2-5 dm. long)
- Atriplex, *Atriplex arenaria*.**
- 9b. Leaves oval to broadly triangular, broadest below the middle, often toothed or lobed; plants of cultivated grounds, waste places, and woods —10.
- 10a. Foliage strongly aromatic (5-10 dm. high)
- Mexican Tea, *Chenopodium ambrosioides*.**
- 10b. Foliage not aromatic, although often heavy-scented or ill-scented —11.
- 11a. Principal leaves triangular-hastate, the margins nearly or quite entire (some of the upper ones may be narrower) (4-10 dm. high) —12.
- 11b. Principal leaves ovate to oblong, barely sinuate to entire —13.
- 11c. Principal leaves ovate to triangular, conspicuously toothed —14.

- 12a. Stems erect, simple or sparingly branched
Good King Henry, *Chenopodium Bonus-Henricus*.
- 12b. Stems diffuse or ascending, freely branched
Orache, *Atriplex patula*.
- 13a. Slender, erect, native plant of woods and thickets (4-10 dm. high)
Goosefoot, *Chenopodium Boscianum*.
- 13b. Weeds of cultivated ground and waste places —16.
- 14a. Leaves with 1-4 large sharp teeth on each side (5-12 dm. high)
Goosefoot, *Chenopodium hybridum*.
- 14b. Leaves with more numerous teeth —15.
- 15a. Leaves whitened or somewhat mealy on the lower side —16.
- 15b. Leaves green beneath (2-8 dm. high) —17.
- 16a. Stems erect (5-15 dm. high)
Lamb's Quarters, *Chenopodium album*.
- 16b. Stems decumbent at base **Goosefoot, *Chenopodium glaucum*.**
- 17a. Flowers in small heads, in the axils of the leaves or in terminal spikes
Strawberry Blite, *Chenopodium capitatum*.
- 17b. Flowers in terminal panicles; leaves sharply toothed (Goosefoot) —18.
- 18a. Panicles short, not as long as the subtending leaves
Goosefoot, *Chenopodium murale*.
- 18b. Panicles long, exceeding the subtending leaves —19.
- 19a. Calyx green **Goosefoot, *Chenopodium urbicum*.**
- 19b. Calyx red **Goosefoot, *Chenopodium rubrum*.**

AMARANTHACEAE, the Amaranth Family

Herbs, with alternate leaves and inconspicuous greenish or reddish flowers without petals, which are axillary or in dense clusters; distinguished from the preceding family chiefly by the presence of sharp-pointed bracts among the flowers (summer).

- 1a. Flower-clusters axillary (leaves obovate to spatulate) —2
- 1b. Flower-clusters in terminal spikes or panicles, sometimes axillary also —4.
- 2a. Plant erect or ascending, widely branched (3-10 dm. high)
Tumble Weed, *Amaranthus graecizans*.
- 2b. Plants prostrate or decumbent —3.
- 3a. Native plant of sea-beaches (1-2 dm. long)
Amaranth, *Amaranthus pumilus*.

5625 / 263

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- 3b. Weed of waste places and cultivated grounds (2-6 dm. long)
Pigweed, *Amaranthus blitoides*.
- 4a. Native plant of salt or brackish marshes; pistillate flowers without calyx (5-30 dm. high; leaves lanceolate)
Water Hemp, *Acnida cannabina*.
- 4b. Weeds of cultivated grounds and waste places; pistillate flowers with a calyx (leaves ovate to ovate-lanceolate) —5.
- 5a. Principal leaves with a pair of spines at their base (5-10 dm. high)
Thorny Amaranth, *Amaranthus spinosus*.
- 5b. Spines none at the base of the leaves (5-20 dm. high) (Pigweed) —6.
- 6a. Spikes short, 1-8 cm. long, crowded in dense ovoid panicles; the terminal spike not conspicuously elongated beyond the appressed or ascending lower ones
Pigweed, *Amaranthus retroflexus*.
- 6b. Spikes slender, 1-12 cm. long, the terminal spike greatly exceeding the short inconspicuous divergent lower ones
Pigweed, *Amaranthus hybridus*.

PHYTOLACCACEAE, the Pokeweed Family

Tall herbs with alternate ovate-lanceolate entire leaves, small flowers without petals, the 5 sepals petal-like, 10 stamens, and a many-celled ovary.

1. Flowers whitish, 5 mm. wide, in long racemes, followed by dark purple berries (1-2 m. high; summer)
Pokeweed, *Phytolacca decandra*.

ILLECEBRACEAE, the Knotwort Family

Herbs, with opposite entire leaves and minute flowers without petals (prostrate, spreading, or freely branched plants, 3 dm. high or long, or less; summer).

- 1a. Stipules none; leaves subulate, slightly connate at base (weed of waste places, 5-10 cm. high) **Knawel, *Scleranthus annuus*.**
- 1b. Stipules present, but small; leaves elliptical or oval (native plants of woods) (Forked Chickweed) —2.
- 2a. Stems hairy; internodes seldom more than 1 cm. long; leaves mostly less than 1 cm. long
Forked Chickweed, *Anychia polygonoides*.

- 2b. Stems smooth; internodes about 2 cm. long; leaves mostly 1-2 cm. long
Forked Chickweed, *Anychia canadensis*.

AIZOACEAE, the Carpet-weed Family

Usually prostrate or spreading herbs, with whorled or opposite leaves and small whitish axillary flowers without petals; sepals 5; stamens 5 or 3 (stems 1-3 dm. long; summer).

- 1a. Leaves whorled; a common weed

Carpet-weed, *Mollugo verticillata*.

- 1b. Leaves opposite; on sea beaches

Sea Purslane, *Sesuvium maritimum*.

CARYOPHYLLACEAE, the Pink Family

Herbs, with opposite or whorled entire leaves, and stems frequently swollen at the joints; sepals 4 or 5; petals separate, as many as the sepals, or rarely none; stamens twice as many as the petals in the plants with conspicuous flowers, sometimes fewer in those with small flowers; ovary 1-celled with 2-5 styles.

- 1a. Calyx spreading, of separate sepals; flowers 15 mm. wide or more often less; petals sometimes none —2.

- 1b. Calyx tubular, of united sepals, surrounding the long slender bases of the petals; flowers in many species more than 15 mm. wide; petals always present —16.

- 2a. Petals entire, or too small to be seen plainly, or none —3.

- 2b. Petals 2-lobed, sometimes so deeply that they appear to be 10 separate petals instead of 5 (flowers white) —10.

- 3a. Leaves linear —4.

- 3b. Leaves oblong to ovate (1-3 dm. high; flowers white, spring and summer) (Sandwort) —8.

- 4a. Petals pink (1-2 dm. high; summer) (Sand Spurrey) —5.

- 4b. Petals white or none —6.

- 5a. Leaves 15-30 mm. long Sand Spurrey, *Spergularia marina*.

- 5b. Leaves 4-8 mm. long Sand Spurrey, *Spergularia rubra*.

- 6a. Leaves whorled (1-5 dm. high; summer)

Spurrey, *Spergula arvensis*.

- 6b. Leaves crowded and overlapping; flowers 10-15 mm. wide

(1-3 dm. high; spring and summer)

Sandwort, *Arenaria caroliniana*.

6c. Leaves opposite, not crowded; flowers 2-3 mm. wide (1 dm. high or less; spring to fall) (**Pearlwort**) —7.

7a. Sepals 4

Pearlwort, *Sagina procumbens*.

7b. Sepals 5

Pearlwort, *Sagina decumbens*.

8a. Leaves less than 1 cm. long; flowers 4 mm. wide

Sandwort, *Arenaria serpyllifolia*.

8b. Leaves 10-25 mm. long; flowers 6-8 mm. wide —9.

9a. Leaves fleshy, clasping the stem, oval to broadly ovate (seashores)

Sandwort, *Arenaria peploides*.

9b. Leaves thin, not clasping, oval or oblong; dry soil

Sandwort, *Arenaria lateriflora*.

10a. Styles 3; capsule splitting lengthwise into 3 sections at maturity (**Chickweed**) —11.

10b. Styles 5 (rarely 4); capsule opening by terminal teeth at maturity (1-5 dm. high, or prostrate; spring and summer) (**Mouse-ear Chickweed**) —14.

11a. Leaves ovate (1-4 dm. high; flowers about 5 mm. wide, all year)

Chickweed, *Stellaria media*.

11b. Leaves linear or narrowly lanceolate (2-6 dm. high) —12.

12a. Flowers 15-20 mm. wide (spring)

Chickweed, *Stellaria Holostea*.

12b. Flowers 7-10 mm. wide (early summer) —13.

13a. Leaves linear or nearly so; flower-cluster lateral

Chickweed, *Stellaria longifolia*.

13b. Leaves lanceolate, broadest near the base; flower-cluster terminal

Chickweed, *Stellaria graminea*.

14a. Flowers about 15 mm. wide; leaves nearly linear

Mouse-ear Chickweed, *Cerastium arvense*.

14b. Flowers less than 10 mm. wide; leaves oblong to spatulate —15.

15a. Annual, mostly erect, the lowest flower-stalks becoming 2-5 cm. long

Mouse-ear Chickweed, *Cerastium nutans*.

15b. Annual, diffusely branched, the flower-stalks rarely 1 cm. long; bracts green

Mouse-ear Chickweed, *Cerastium viscosum*.

15c. Perennial, diffusely branched, densely tufted at the base, with short flower-stalks; bracts thin and pale at the margin

Mouse-ear Chickweed, *Cerastium vulgatum*.

- 16a. Styles 5, or the flowers bearing stamens only (summer) —17.
16b. Styles 3 —19.
16c. Styles 2 (summer) —24.
- 17a. Calyx-teeth much longer than the calyx-tube (4-10 dm. high; leaves linear, about 5 mm. wide; flowers red, 4-5 cm. wide)
Corn Cockle, *Agrostemma Githago*.
- 17b. Calyx-teeth shorter than the calyx-tube (3-6 dm. high; leaves oblong to obovate; flowers about 2 cm. wide; petals deeply lobed) —18.
- 18a. Flowers white or pink, fragrant, opening in the evening
White Campion, *Lychnis alba*.
- 18b. Flowers red or rarely white, not fragrant, opening in the daytime
Red Campion, *Lychnis dioica*.
- 19a. Leaves whorled, ovate-lanceolate (6-10 dm. high; flowers white, 2 cm. wide, with fringed petals, summer)
Starry Campion, *Silene stellata*.
- 19b. Leaves opposite —20.
- 20a. Flowers nocturnal, always wilted by day (3-8 dm. high; upper leaves ovate-lanceolate; flowers white or pinkish, about 2 cm. wide, summer)
Catchfly, *Silene noctiflora*.
- 20b. Flowers expanded during the day —21.
- 21a. A portion of the middle of some joints of the stem distinctly viscid (2-8 dm. high; flowers pink or purplish, summer) (Catchfly) —22.
- 21b. Stems not viscid; flowers opening by day —23.
- 22a. Flowers 3-4 mm. wide; upper leaves narrowly lanceolate to linear
Catchfly, *Silene antirrhina*.
- 22b. Flowers 12-16 mm. wide; upper leaves ovate or ovate-lanceolate
Catchfly, *Silene Armeria*.
- 23a. Flowers white, 15-20 mm. wide; calyx much inflated (2-5 dm. high; leaves ovate-lanceolate; summer)
Bladder Campion, *Silene latifolia*.
- 23b. Flowers pink, 25 mm. wide; calyx not inflated (1-3 dm. high; leaves lanceolate; spring)
Wild Pink, *Silene pennsylvanica*.
- 24a. Leaves linear, 5 mm. wide or less (flowers pink or purplish) —25.
- 24b. Leaves lanceolate to ovate, more than 5 mm. wide (3-9 dm. high) —26.

- 25a. Flowers about 8 mm. wide, in dense terminal clusters, almost sessile (2-5 dm. high) **Deptford Pink, *Dianthus Armeria*.**
- 25b. Flowers 3-4 mm. wide, in open loose panicles, distinctly pedicelled (1-2 dm. high) **Gypsophyll, *Gypsophila muralis*.**
- 26a. Flowers 6-8 mm. wide, pink to red **-31**
Cow-herb, *Saponaria Vaccaria*.
- 26b. Flowers 2-3 cm. wide, white to pink —27.
- 27a. Leaves with 3-5 principal veins from the base
Soapwort, *Saponaria officinalis*.
- 27b. Leaves with a single prominent midvein
Sweet William, *Dianthus barbatus*.

PORTULACACEAE, the Purslane Family

Low herbs with opposite or alternate leaves and regular flowers with 2 sepals, 5 petals, and a 1-celled ovary.

- 1a. Leaves a single opposite pair on each stem, linear; 1-2 dm. high; flowers pink or white, 10-15 mm. wide, in short racemes, early spring
Spring Beauty, *Claytonia virginica*.
- 1b. Leaves numerous, obovate, thick and fleshy (prostrate weed; flowers yellow, 5 mm. wide, sessile, summer)
Purslane, *Portulaca oleracea*.

CERATOPHYLLACEAE, the Hornwort Family

Submerged aquatics, with whorled, finely dissected leaves and inconspicuous, solitary, sessile flowers with neither calyx nor corolla.

1. In slow streams and ponds **Hornwort, *Ceratophyllum demersum*.**

NYMPHAEACEAE, the Water Lily Family

Aquatic plants, with usually large, floating or aerial leaves which are round or elliptical and palmately veined; stamens numerous (summer).

- 1a. Floating and emersed leaves centrally peltate —2.
- 1b. Leaves rounded but not peltate, with a deep sinus —3.
- 2a. Leaves round, 3 dm. or more in diameter, mostly aerial on long petioles, flowers 15-20 cm. wide, pale yellow; petals numerous
Lotus, *Nelumbo lutea*.
- 2b. Leaves oval, floating, 5-15 cm. long; flowers small, purple, 1 cm. wide; sepals and petals each 3
Water Shield, *Brasenia Schreberi*.

- 3a. Flowers white or tinged with pink; the numerous petals much larger than the 4 sepals **Water Lily, Castalia odorata.**
- 3b. Flowers yellow; the petals small and stamen-like, smaller than the 5-6 petal-like sepals (Pond Lily) —4.
- 4a. Leaves 15-30 cm. long; stigma yellow or pink
Pond Lily, Nymphaea advena.
- 4b. Leaves somewhat smaller; stigma bright red
Pond Lily, Nymphaea rubrodisca.
- 4c. Leaves generally less than 10 cm. long; stigmas dark red
Pond Lily, Nymphaea microphylla.

RANUNCULACEAE, the Crowfoot Family

Herbs with alternate (rarely opposite) leaves, acrid watery juice, separate sepals and petals, numerous stamens, and several or many (rarely only 1) simple pistils. Petals present or absent: in the latter case the sepals are usually petal-like in appearance.

- 1a. Aquatic plants with finely dissected submerged leaves (late spring and summer) (Water Crowfoot) —2.
- 1b. Terrestrial or mud plants, without dissected submerged leaves —4.
- 2a. Flowers yellow, 2-3 cm. wide
Water Crowfoot, Ranunculus delphinifolius.
- 2b. Flowers white, 1-2 cm. wide —3.
- 3a. Leaves soft, collapsing when removed from the water
Water Crowfoot, Ranunculus aquatilis var. capillaceus.
- 3b. Leaves rigid, not collapsing when removed from the water
Water Crowfoot, Ranunculus circinatus.
- 4a. Each of the 5 petals prolonged backwards into a long conspicuous spur (3-6 dm. high; flowers nodding, 3-4 cm. long, scarlet and yellow, spring; leaves decompose)
Columbine, Aquilegia canadensis.
- 4b. One of the petal-like sepals prolonged backward into a spur (4-8 dm. high; flowers blue, 2-3 cm. wide, irregular, summer; leaves palmately dissected into linear lobes)
Larkspur, Delphinium Ajacis.
- 4c. None of the petals spurred, or petals none; flowers regular —5.
- 5a. Flowers yellow —6.
- 5b. Flowers of various other colors —25.

- 6a. Petals yellow and conspicuous (although often small), subtended by the normal green or somewhat yellowish sepals —7.
6b. Sepals yellow and conspicuous; petals either none, or else reduced to small structures much smaller than the sepals —23.
7a. Leaves linear to narrowly oblong, or the lower ones ovate, entire or with minute teeth (Spearwort) —8.
7b. Leaves ovate-heart-shaped to kidney-shaped, crenately toothed but none of them lobed (flower-stalks 3–15 cm. high) —10.
7c. Leaves all or mostly lobed or divided or compound —12.
8a. Flowers only 5 mm. wide, the petals no longer than the sepals (1–4 dm. high; spring and summer)

Spearwort, *Ranunculus pusillus*.

- 8b. Flowers 10–15 mm. wide, the petals distinctly longer than the sepals (summer) —9.
9a. Stems prostrate and trailing, rooting at the joints; fruits pointed with a minute short beak

Spearwort, *Ranunculus Flammula* var. *reptans*.

- 9b. Stems ascending (4–8 dm. high), rooting at the lower joints only; fruits tipped with a long slender beak

Spearwort, *Ranunculus laxicaulis*.

- 10a. Stem-leaves several, lanceolate to linear; flowers only about 5 mm. wide —8a.
10b. Stem-leaves only 1–3, broadly heart-shaped like the basal ones (1–2 dm. high) —11.
11a. Flowers not more than 10 mm. wide (summer)

Sea-side Crowfoot, *Ranunculus Cymbalaria*.

- 11b. Flowers about 25 mm. wide (spring)

Lesser Celandine, *Ranunculus Ficaria*.

- 12a. Basal leaves, or most of them, merely crenate or toothed, and not obviously lobed, the stem-leaves deeply divided; flowers seldom more than 6 mm. wide (2–5 dm. high; spring) (Small-flowered Crowfoot) —13.
12b. Basal and stem-leaves all lobed or divided; flowers much larger —14.
13a. Foliage smooth or minutely hairy; basal leaves distinctly heart-shaped at base

Small-flowered Crowfoot, *Ranunculus abortivus*.

- 13b. Foliage hairy with conspicuous spreading hairs; basal leaves barely heart-shaped or not at all

Small-flowered Crowfoot, *Ranunculus micranthus*.

- 14a. Flowers 1 cm. wide or smaller —15.

- 14b. Flowers 2 cm. wide or larger —18.

- 15a. Plant smooth and succulent; stem hollow (1-5 dm. high; spring and summer) **Cursed Crowfoot, *Ranunculus sceleratus*.**

- 15b. Plant hairy or rough —16.

- 16a. Leaves merely lobed, none of their divisions on individual stalks; plant of shady woods (2-6 dm. high; late spring)

Buttercup, *Ranunculus recurvatus*.

- 16b. Leaves compound, at least the terminal division on a distinct stalk (2-6 dm. high) —17.

- 17a. Marsh plant with erect stems

Buttercup, *Ranunculus pennsylvanicus*.

- 17b. Plant of upland woods, the stems ascending or spreading —20b.

- 18a. Leaves dissected into numerous linear or narrowly wedge-shaped divisions; plants of water or very wet places (late spring and summer) —2a.

- 18b. Leaves deeply palmately lobed or compound (Buttercup) —19.

- 19a. Lateral divisions of each compound leaf on distinct long stalks; plants ascending, prostrate, or rarely erect (2-8 dm. long; spring; our two commonest Buttercups) —20.

- 19b. Lateral divisions of each compound leaf sessile or on very short stalks —21.

- 20a. Roots all fibrous; plants of wet soil

Buttercup, *Ranunculus septentrionalis*.

- 20b. Roots thickened; plant of dry woods and thickets

Buttercup, *Ranunculus hispidus*.

- 21a. Stem creeping and rooting at the joints (spring and summer)

Buttercup, *Ranunculus repens*.

- 21b. Stem erect or ascending (spring and all summer) —22.

- 22a. Terminal lobe of the leaf stalked (2-5 dm. high)

Buttercup, *Ranunculus bulbosus*.

- 22b. Terminal lobe of the leaf sessile (5-10 dm. high)

Buttercup, *Ranunculus acris*.

- 23a. Leaves merely crenate or toothed, heart-shaped or kidney-shaped; petals none; flowers about 3 cm. wide (2-4 dm. high; spring)

Cowslip, *Caltha palustris*.

- 23b. Leaves deeply divided; flowers 3-5 cm. wide; petals present (3-6 dm. high; spring and early summer) —24.
- 23c. Leaves entire, opposite —25a.
- 24a. Petals 15-25, flat; leaf-lobes coarsely toothed or incised; native plant of swamps **Globe-flower, Trollius laxus.**
- 24b. Petals 8-10, tubular; leaf-lobes merely toothed; introduced plant of waste places **Green Hellebore, Helleborus viridis.**
- 25a. Leaves simple, entire, ovate, opposite (3-6 dm. high; flowers greenish, late spring) **Leather-flower, Clematis ochroleuca.**
- 25b. Leaves lobed or deeply divided, their divisions not separated by distinct stalks —26.
- 25c. Leaves truly compound, all their divisions separated by distinct elongate stalks —32.
- 26a. Leaves all basal (flower-stalks 1-2 dm. high) —27.
- 26b. Stem-leaves present —28.
- 27a. Lobes of the leaf entire (flowers pink-purple, early spring) **Hepatica, Hepatica triloba.**
- 27b. Divisions of the leaf separate to the base, toothed; flowers white (spring and early summer) **Gold-thread, Coptis trifolia.**
- 28a. Petals none; sepals petal-like, 4-9 (Anemone) —29.
- 28b. Petals present, but much smaller than the petal-like sepals —24.
- 29a. Stem-leaves sessile or nearly so (4-7 dm. high; late spring and early summer) **Anemone, Anemone canadensis.**
- 29b. Stem-leaves on definite petioles —30.
- 30a. Achenes densely woolly; flowers white, 2-3 cm. wide, appearing in summer (4-9 dm. high) —31.
- 30b. Achenes merely finely hairy; stems 1-flowered; woodland species blooming in early spring (1-2 dm. high; flowers white) **Wood Anemone, Anemone quinquefolia.**
- 31a. Segments of the basal leaves wedge-lanceolate; head of fruit cylindric **Anemone, Anemone cylindrica.**
- 31b. Segments of the basal leaves ovate-lanceolate; head of fruit ovoid or oblong **Anemone, Anemone virginiana.**
- 32a. Flowers pale blue, 5-10 cm. wide (trailing over bushes; late spring) **Mountain Clematis, Clematis verticillaris.**
- 32b. Flowers white or greenish or pale pink-purple, much smaller in size —33.
- 33a. Flowers white, about 2 cm. wide, in large panicles in summer; climbing vine **Virgin's Bower, Clematis virginiana.**

- 33b. Flowers few, about 2 cm. wide, white or pink, in small terminal umbel-like clusters; woodland plants blooming in early spring (1-3 dm. high) **Rue Anemone, Anemonella thalictroides.**
- 33c. Flowers white, in terminal racemes —34.
- 33d. Flowers numerous, in branching panicles; sepals dropping early, petals none (Meadow Rue) —36.
- 34a. Racemes slender, 10-90 cm. long (8-15 dm. high; summer) **Bugbane, Cimicifuga racemosa.**
- 34b. Racemes short and stout, 3-8 cm. long (4-8 dm. high; late spring) (Baneberry) —35.
- 35a. Berries white; pedicels strongly thickened at maturity **Baneberry, Actaea alba.**
- 35b. Berries red; pedicels slender at maturity **Baneberry, Actaea rubra.**
- 36a. Blooming in early spring; stem-leaves with long petioles (3-7 dm. high) **Meadow Rue, Thalictrum dioicum.**
- 36b. Blooming in late spring or summer; stem-leaves sessile or on petioles not over 3 cm. long (8-15 dm. high) —37.
- 37a. Filaments club-shaped, approximately as wide as the anther **Meadow Rue, Thalictrum polygamum.**
- 37b. Filaments slender or thread-like —38.
- 38a. Leaves minutely hairy beneath, but not glandular **Meadow Rue, Thalictrum dasycarpum.**
- 38b. Leaves minutely glandular beneath **Meadow Rue, Thalictrum revolutum.**

MAGNOLIACEAE, the Magnolia Family

Trees or shrubs with alternate leaves and large, frequently showy flowers; sepals 3, petals 6-9; stamens numerous (late spring).

- 1a. Leaves oval or ovate-lanceolate, entire, whitened beneath, (shrub or small tree; flowers white) **Sweet Bay, Magnolia virginiana.**
- 1b. Leaves 4-lobed (tall tree; flowers greenish and orange) **Tulip Tree, Liriodendron Tulipifera.**

MENISPERMACEAE, the Moonseed Family

Dioecious woody climbers, with alternate leaves, 4-8 sepals, 6-8 petals; numerous stamens in the sterile flowers; 2-4 pistils in the fertile flowers.

1. Twining; leaves rounded, palmately lobed, peltate (flowers white, 3-4 mm. wide, in panicles; summer)

Moonseed, *Menisperm canadense*.

BERBERIDACEAE, the Barberry Family

Shrubs or herbs; sepals 6 or more; petals 6 or more, separate; stamens 6-18, frequently opening by two terminal lids; pistil 1.

- 1a. Leaves simple, toothed; stems shrubby, more or less thorny, 1-2 m. high (flowers yellow, 8 mm. wide, in racemes, spring)

Barberry, *Berberis vulgaris*.

- 1b. Stem herbaceous, bearing a single pair of large palmately lobed leaves (4-6 dm. high; flowers solitary, terminal, white, 4-5 cm. wide, spring)

May Apple, *Podophyllum peltatum*.

- 1c. Stem herbaceous, the leaves ternately compound with numerous leaflets (4-8 dm. high; flowers in clusters, small, yellowish green, spring)

Blue Cohosh, *Canthophyllum thalictroides*.

LAURACEAE, the Laurel Family

Trees or shrubs, with aromatic taste or odor, and alternate simple leaves; flowers small, often imperfect; perianth 6-parted; stamens 9, the anthers opening by lids.

- 1a. Freely branched shrub 1-3 m. high; leaves obovate-oblong, entire (flowers yellow, in crowded lateral clusters in early spring, before the leaves expand)

Spice Bush, *Benzoin aestivale*.

- 1b. Tree or tall shrub; some or all of the leaves 2-3-lobed (flowers greenish yellow, in long stalked terminal clusters appearing with the leaves)

Sassafras, *Sassafras variifolium*.

PAPAVERACEAE, the Poppy Family

Herbs with milky or colored juice, lobed or divided leaves, 2 sepals, 4 to 12 petals, numerous stamens, and a 1-celled ovary.

- 1a. Leaf single, basal, lobed; petals 8-12, white; flower solitary, 3-4 cm. wide (early spring)

Bloodroot, *Sanguinaria canadensis*.

- 1b. Leaves on the stem; petals 4 or 6; flowers several — 2.

2a. Flowers yellow, petals 4 — 3.

2b. Flowers some shade of red (3-8 dm. high; summer) (Poppy)

— 4.

- 2c. Flowers bluish white with purple center, 8-10 cm. wide; leaf clasping the stem (4-10 dm. high; summer)

Poppy, *Papaver somniferum*.

3a. Flowers about 15 mm. wide, in small umbels (3-6 dm. high; spring and early summer) **Celandine, *Chelidonium majus*.**

3b. Flowers 30-40 mm. wide, one on each stalk

Horned Poppy, *Glaucium flavum*.

4a. Capsule hairy

Poppy, *Papaver Argemone*.

4b. Capsule smooth —5.

5a. Capsule more than twice as long as thick

Poppy, *Papaver dubium*.

5b. Capsule less than twice as long as thick

Poppy, *Papaver Rhoeas*.

FUMARIACEAE, the Fumitory Family

Herbs with watery juice, compound or dissected leaves, and irregular flowers; sepals 2, small; petals 4, in two pairs, and one or both of the outer pair spurred or sack-like at the base; stamens 6.

1a. Both outer petals spurred or sack-like at base —2.

1b. One outer petal spurred or sack-like at the base —3.

2a. Climbing or scrambling vine with flowers in panicles, white or pinkish, about 1 cm. long (summer)

Climbing Fumitory, *Adlumia fungosa*.

2b. Low herb (2-4 dm.) with basal leaves and white or pinkish flowers in racemes (early spring)

Dutchman's Breeches, *Dicentra Cucullaria*.

3a. Flowers about 5 mm. long, pinkish tipped with red (3-8 dm. high; summer) **Fumitory, *Fumaria officinalis*.**

3b. Flowers 10 mm. long or more, yellow, at least at the tip (2-6 dm. high) —4.

4a. Flowers pink or purplish, tipped with yellow (spring and summer) **Corydalis, *Corydalis sempervirens*.**

4b. Flowers yellow throughout (spring)

Corydalis, *Corydalis flavula*.

CRUCIFERAE, the Mustard Family

Herbs, with alternate, frequently lobed, compound, or dissected leaves, and regular flowers, usually in racemes; sepals 4; petals 4; stamens 6, 4 long and 2 short (or rarely 2 only); ovary 1. The petals are absent in a very few species. Pods are often necessary for satisfactory identification.

- 1a. Petals none; flowers very small —56.
1b. Petals yellow or yellowish —2.
1c. Petals white to pink or purple, never yellow —22.
2a. Leaves simple, entire or toothed, never lobed —3.
2b. Leaves deeply lobed or compound (the bracteal leaves, at or near the flower-clusters, may be simple and unlobed) —3.
3a. Leaves clasping the stem at their base (3-8 dm. high; spring and summer) —4.
3b. Leaves not clasping the stem, although they may be sessile (summer) —6.
4a. Clasping base and apex of the leaf obtuse or rounded; pod very long and slender **Hare's Ear, Conringia orientalis.**
4b. Clasping base and apex of the leaf acute; pod obovoid or subglobose (False Flax) —5.
5a. Stem and leaves smooth; pods 6-7 mm. wide
False Flax, Camelina sativa.
5b. Leaves, and usually the stem also, hairy; pods 4-5 mm. wide
False Flax, Camelina microcarpa.
5c. Stem hairy; pods 2-3 mm. wide
Ball Mustard, Neslia paniculata.
6a. Flowers about 2 mm. wide (1-2 dm. high)
Yellow Alyssum, Alyssum alyssoides.
6b. Flowers 5 mm. wide or larger —7.
7a. Leaves ovate or lanceolate, acute at base; flowers about 15 mm. wide (summer) —9.
7b. Leaves lanceolate, entire or minutely toothed; flowers about 6 mm. wide (2-6 dm. high)
Worm-seed Mustard, Erysimum cheiranthoides.
8a. Pod terminating in a conspicuous seedless beak; petals 7 mm. long or more (summer) —9.
8b. Pod not terminating in a seedless beak; petals smaller —15.
9a. Pod gradually narrowed at its tip into a stout flattened or angled beak (3-8 dm. high) —10.
9b. Pod tipped with a slender beak whose base is much narrower than the pod (5-15 dm. high) —12.
10a. Pod dehiscent when ripe into two halves, tipped with a flat or angled beak —11.

- 10b. Pod indehiscent, with spongy cross partitions between the seeds, tipped with a conical beak
Wild Radish, Raphanus Raphanistrum.
- 11a. Leaves deeply pinnatifid **White Mustard, Brassica alba.**
- 11b. Leaves toothed or somewhat lobed **Charlock, Brassica arvensis.**
- 12a. Pod less than 2 cm. long at maturity
Black Mustard, Brassica nigra.
- 12b. Pod 25-35 mm. long at maturity —13.
- 13a. Beak of the pod 5-10 mm. long
Indian Mustard, Brassica juncea.
- 13b. Beak of the pod 2-3 mm. long —14.
- 14a. Flowers about 10 mm. wide; leaves mostly only near the base of the stem
Sand Rocket, Diplotaxis tenuifolia.
- 14b. Flowers about 15 mm. wide; stems leafy
Wall Rocket, Diplotaxis muralis.
- 15a. Pods closely appressed to the stem; flowers only 3 mm. wide or less (3-7 dm. high; spring and all summer)
Hedge Mustard, Sisymbrium officinale.
- 15b. Pods spreading out from the stem; flowers 4-8 mm. wide —16.
- 16a. Leaves doubly pinnatifid into numerous linear segments (3-8 dm. high; summer) **Herb Sophia, Sisymbrium Sophia.**
- 16b. Leaves once-pinnatifid only —17.
- 17a. Pods 25 mm. long or more —18.
- 17b. Pods 12 mm. long or less (summer) (Yellow Cress) —21.
- 18a. Terminal segment of the principal leaves equaling or smaller than the lateral ones (5-10 dm. high; summer)
Sisymbrium, Sisymbrium altissimum.
- 18b. Terminal segment of the principal leaves much larger than the lateral ones (3-6 dm. high; late spring and early summer) (Winter Cress) —19.
- 19a. Lateral leaf-segments 5-8 pairs on the principal leaves
Winter Cress, Barbarea verna.
- 19b. Lateral leaf-segments 1-4 pairs on the principal leaves —20.
- 20a. Flowers bright yellow, in racemes; pods spreading or ascending
Winter Cress, Barbarea vulgaris.
- 20b. Flowers pale yellow, in rounded clusters; pods erect or somewhat appressed
Winter Cress, Barbarea stricta.
- 21a. Stems creeping, with erect or ascending branches; flowers about 8 mm. wide
Yellow Cress, Radicula sylvestris.

- 21b. Stems erect or ascending; flowers about 4 mm. wide (4-12 dm. high)
Yellow Cress, *Radicula palustris*.
- 22a. Principal leaves compound or deeply lobed (the uppermost or bracteal leaves may be simple) —23.
- 22b. Principal leaves entire, toothed, or sometimes shallowly lobed —34.
- 23a. Leaves ternately divided or compound (2-4 dm. high; spring)
 (Toothwort) —24.
- 23b. Leaves pinnately divided or compound —26.
- 24a. Leaf-segments of the stem-leaves (not the basal leaves) lanceolate or narrowly oblong —25.
- 24b. Leaf-segments of the stem-leaves ovate or ovate-oblong
Toothwort, *Dentaria diphylla*.
- 25a. Basal leaves and stem-leaves quite unlike in shape
Toothwort, *Dentaria heterophylla*.
- 25b. Basal leaves and stem-leaves similar
Toothwort, *Dentaria laciniata*.
- 26a. Plant growing in water, or in mud near water (spring and summer)
Water Cress, *Radicula Nasturtium-aquaticum*.
- 26b. Plants of dry or moist soil, not aquatics —27.
- 27a. Pods reverse-triangular, somewhat notched at the end; flowers about 3 mm. wide (2-5 dm. high; spring to fall)
Shepherd's Purse, *Capsella Bursa-pastoris*.
- 27b. Pods round or broadly ovate, nearly or quite as broad as long; flowers about 2 mm. wide —28.
- 27c. Pods distinctly elongated; flowers 2-20 mm. wide —30.
- 28a. Stems erect or nearly so; pod smooth (2-5 dm. high; spring to fall) (Pepper Grass) —42.
- 28b. Stems diffusely spreading; pod rough (stems 1-4 dm. long; summer) (Wart Cress) —29.
- 29a. Pod notched at the apex, roughly wrinkled
Wart Cress, *Coronopus didymus*.
- 29b. Pod not notched at the apex, covered with tubercles
Wart Cress, *Coronopus procumbens*.
- 30a. Flowers 12-20 mm. wide (3-8 dm. high; summer) —10b.
- 30b. Flowers 2-8 mm. wide —31.
- 31a. Flowers cream-color, or even pale yellow, in summer —18a.
- 31b. Flowers pure white —32.

- 32a. Stem-leaves entire or toothed, only the basal leaves lobed (1-3 dm. high; spring and summer) —53a.
- 32b. Stem-leaves deeply lobed (spring) (Bitter Cress) —33.
- 33a. Plant of dry soil; flowers about 3 mm. wide (1-4 dm. high)
Bitter Cress, *Cardamine parviflora*.
- 33b. Plant of moist or wet soil; flowers about 5 mm. wide (2-9 dm. high)
Bitter Cress, *Cardamine pennsylvanica*.
- 34a. Pod divided transversely into 2 distinct joints (2-3 dm. high; summer)
Sea Rocket, *Cakile edentula*.
- 34b. Pod not more than twice as long as broad —35.
- 34c. Pod elongated, more than twice as long as broad —44.
- 35a. Stem-leaves sessile and clasping at the base —36.
- 35b. Stem-leaves sessile or petioled, but not clasping —38.
- 36a. Pod reverse-triangular, broadly notched at the apex, narrowed at the base —27a.
- 36b. Pod round or oval, very flat (2-5 dm. high) —37.
- 36c. Pod obovoid or pear-shaped, not flat (3-6 dm. high; spring and summer) —5.
- 37a. Pod about 10 mm. in diameter, circular, notched at the end (summer)
Penny Cress, *Thlaspi arvense*.
- 37b. Pod not more than 5 mm. wide, ovate, minutely notched at the end (late spring and summer)
Pepper Grass, *Lepidium campestre*.
- 37c. Pod not more than 5 mm. wide, heart-shaped, not notched at the end
Pepper Grass, *Lepidium Draba*.
- 38a. Pod not conspicuously flattened, thick and plump, about circular in cross-section (summer) —39.
- 38b. Pod distinctly flat —40.
- 39a. Plant escaped from cultivation in dry or moist soil; flowers 6-8 mm. wide; principal leaves 10-30 cm. long (6-10 dm. high)
Horse Radish, *Radicula Armoracia*.
- 39b. Plant of waste places; flowers 2-3 mm. wide; principal leaves 1-4 cm. long (3-6 dm. high)
Hoary Alyssum, *Berteroa incana*.
- 40a. Pod about circular, or a very little longer than wide —41.
- 40b. Pod ovoid or oblong, distinctly longer than wide —43.
- 41a. Leaves entire (summer) —6.
- 41b. Leaves toothed (2-5 dm. high; spring to fall) (Pepper Grass) —42.

- 42a. Petals present **Pepper Grass, *Lepidium virginicum*.**
 42b. Petals none **Pepper Grass, *Lepidium apetalum*.**
- 43a. About 1 dm. high, blooming in spring; leaves mostly basal; stems nearly smooth —54.
 43b. About 3-6 dm. high, blooming in summer; leaves mostly on the stem; stems hairy —39b.
- 44a. Stem-leaves with a broad clasping or closely sessile base —45.
 44b. Stem-leaves not clasping, either sessile or petioled —48.
- 45a. Leaves entire (3-8 dm. high; late spring and early summer) —4a.
 45b. Leaves toothed (4-12 dm. high; late spring and summer) (Rock Cress) —46.
- 46a. Petals conspicuous, about twice as long as the calyx or longer; straight, erect, mostly unbranched plants
Rock Cress, *Arabis laevigata*.
- 46b. Petals inconspicuous, equaling or but slightly longer than the sepals —47.
- 47a. Stem-leaves and stem smooth and glaucous
Rock Cress, *Arabis glabra*.
- 47b. Stem-leaves and stem almost always hairy and never glaucous
Rock Cress, *Arabis hirsuta*.
- 48a. Lower leaf-blades almost as broad as long —49.
 48b. Lower leaf-blades at least twice as long as broad —51.
- 49a. Principal leaves 5-15 cm. long (4-10 dm. high; late spring and early summer)
Garlic Mustard, *Alliaria officinalis*.
- 49b. Principal leaves not over 5 cm. long (1-6 dm. high; spring) (Bitter Cress) —50.
- 50a. Flowers purple or rose-color
Bitter Cress, *Cardamine Douglassii*.
- 50b. Flowers white
Bitter Cress, *Cardamine bulbosa*.
- 51a. Principal stem-leaves 7-10 cm. long, or more (4-10 dm. high) —52.
 51b. Principal stem-leaves 2-5 cm. long —53.
- 52a. Flowers 10 mm. or less wide; leaves lanceolate or oblong (summer)
Rock Cress, *Arabis canadensis*.
- 52b. Flowers 15-20 mm. wide; leaves ovate or ovate-lanceolate (late spring and summer)
Dame's Rocket, *Hesperis matronalis*.
- 53a. Basal leaves pinnatifid (1-3 dm. high; spring and summer)
Rock Cress, *Arabis lyrata*.

53b. Basal leaves entire or toothed (spring) —54.

54a. Petals deeply 2-cleft (3-15 cm. high)

Whitlow Grass, *Draba verna*.

54b. Petals entire —55.

55a. Pods flat (3-15 cm. high) Whitlow Grass, *Draba caroliniana*.

55b. Pods plump, somewhat 4-sided (1-4 dm. high)

Rock Cress, *Sisymbrium Thalianum*.

56a. Pods orbicular, very flat (2-5 dm. high; spring to fall) —42b.

56b. Pods elongated (spring) —55a.

CAPPARIDACEAE, the Caper Family

Herbs, with alternate, palmately compound leaves, 4 petals and 6 or more stamens, which are about equal in length; fruit a 1-celled pod.

1a. Stamens 9-12; foliage viscid and glandular-hairy; leaflets 3 (2-4 dm. high; flowers small, yellowish, summer)

Glammy-weed, *Polanisia graveolens*.

1b. Stamens 6; foliage smooth; leaflets 5-7 (6-10 dm. high; flowers purple to white, with very long stamens; summer)

Spider Flower, *Cleome spinosa*.

RESEDACEAE, the Mignonette Family

Herbs, with alternate leaves and terminal racemes of small greenish yellow flowers; sepals 4; petals 4, very unequal in size, the upper ones lobed; stamens numerous, all on one side of the flower (summer).

1. Leaves lanceolate or linear (4-8 dm. high)

Yellow-weed, *Reseda Luteola*.

SARRACENIACEAE, the Pitcher Plant Family

Insectivorous herbs, with basal, hollow, pitcher-shaped leaves and large purple flowers at the end of leafless stems; sepals 5; petals 5; stamens numerous; style greatly expanded above into an umbrella-shaped organ.

1. Flower-stalks 3-5 dm. high (early summer)

Pitcher Plant, *Sarracenia purpurea*.

DROSERACEAE, the Sundew Family

Insectivorous herbs, with a rosette of basal leaves bearing gland-tipped bristles, and with slender racemes of small white flowers in summer; petals and stamens each usually 5.

- 2b. Flowers 2-3 cm. wide, solitary, white; terminating erect stalks; stem-leaf usually one, clasping, broadly ovate (2-5 dm. high; late summer)

Grass of Parnassus, *Parnassia caroliniana*.

- 2c. Flowers small, in terminal racemes, panicles, or clusters (spring and early summer) —3.

- 3a. Leaves oblanceolate to obovate, pinnately veined (Saxifrage) —4.

- 3b. Leaves broadly ovate to nearly circular, palmately veined or lobed —5.

- 4a. Petals white; sepals erect; flowers 5 mm. wide; leaves conspicuously toothed, 3-10 cm. long (1-3 dm. high; spring)

Saxifrage, *Saxifraga virginensis*.

- 4b. Petals greenish; sepals reflexed; flowers 4 mm. wide; leaves minutely toothed or entire, 10-30 cm. long (5-10 dm. high; spring)

Saxifrage, *Saxifraga pennsylvanica*.

- 5a. Petals fringed, white; leaves mostly basal, a single pair on the stem (2-5 dm. high; spring) Miterwort, *Mitella diphylla*.

- 5b. Petals entire; leaves mostly basal —6.

- 6a. Stamens 5 (5-10 dm. high; flowers greenish purple)

Alum Root, *Heuchera americana*.

- 6b. Stamens 10 (2-3 dm. high; flowers white, 5-6 mm. wide, spring)

False Miterwort, *Tiarella cordifolia*.

- 7a. Leaves alternate, broadly rounded, palmately veined and lobed (5-15 dm. high; late spring) —8.

- 7b. Leaves alternate, oblong, minutely toothed, pinnately veined (1-2 m. high; flowers white, in racemes, late spring)

Virginia Willow, *Itea virginica*.

- 7c. Leaves opposite, ovate to oblong (flowers white) —12.

- 8a. Stems not thorny (Currant) —9.

- 8b. Stems thorny (flowers greenish purple to nearly white) (Gooseberry) —10.

- 9a. Petals reddish-purple

Red Currant, *Ribes triste*.

- 9b. Petals greenish or yellowish

Wild Black Currant, *Ribes floridum*.

- 10a. Ovary and fruit prickly or bristly

Gooseberry, *Ribes cynosbati*.

- 10b. Ovary and fruit smooth or a trifle glandular —11.

- 11a. Stamens reaching not quite to the end of the sepals

Gooseberry, *Ribes oxycanthoides*.

11b. Stamens extending conspicuously beyond the end of the sepals
Gooseberry, *Ribes rotundifolium*.

12a. Stamens 8-10; flowers very numerous in a round-topped cluster (1-2 m. high; summer)

Wild Hydrangea, *Hydrangea arborescens*.

12b. Stamens 20 or more; flowers few in a cluster, 2-3 cm. wide, very fragrant (2-4 m. high; spring)

Mock Orange, *Philadelphus coronarius*.

HAMAMELIDACEAE, the Witch Hazel Family

Shrubs or trees, with alternate simple leaves; sepals and petals each 4 or none; stamens 4 or many.

1a. Leaves obovate, crenate or toothed (2-5 m. high; flowers yellow, with petals, autumn) Witch Hazel, *Hamamelis virginiana*.

1b. Leaves deeply 5-lobed and star-shaped (tree; flowers greenish, without petals, in dense heads, spring)

Sweet Gum, *Liquidambar styraciflua*.

PLATANACEAE, the Plane Tree Family

Trees, with broad, palmately veined and lobed leaves, and minute flowers in dense spherical heads.

1. Bark grayish green, scaling off in thin layers

Sycamore, *Platanus occidentalis*.

ROSACEAE, the Rose Family

Trees, shrubs, or herbs, with alternate, frequently lobed or compound leaves; petals and sepals usually 5; stamens numerous; pistils 1 to many; receptacle expanded into a saucer-shaped or cup-shaped organ, bearing the sepals, petals, and stamens at its margin and the pistils at its center, and resembling a calyx-tube or flattened calyx.

1a. Shrubs or trees with compound leaves (leaves always visible when in bloom) —2.

1b. Shrubs or trees with simple leaves (sometimes blooming before the leaves have opened) —10.

1c. Herbaceous plants —23.

2a. Flowers white, about 5 mm. wide, very numerous in large rounded clusters; leaflets 11-17 (small tree; spring)

Mountain Ash, *Pyrus americana*.

2b. Flowers solitary or in small clusters, each usually 20-80 mm. wide; leaflets fewer —3.

- 3a. Flowers yellow, 2-3 cm. wide; leaflets generally 5 or 7 (5-10 dm. high; summer) **Cinquefoil, *Potentilla fruticosa*.**
- 3b. Flowers pink or white, rarely red, 4-8 cm. wide; stems thorny (5-15 dm. high; leaves pinnately compound with stipules adherent to the petiole; early summer) (Rose) —4.
- 3c. Flowers white, 1-3 cm. wide (leaves mostly palmately compound or trifoliate; late spring) —7.
- 4a. The pair of spines at the base of each leaf straight or nearly so —5.
- 4b. The pair of spines at the base of each leaf distinctly curved or hooked —6.
- 5a. Leaves densely glandular-hairy beneath **Sweetbrier, *Rosa rubiginosa*.**
- 5b. Leaves smooth or minutely hairy beneath **Swamp Rose, *Rosa carolina*.**
- 6a. Leaflets shining above **Wild Rose, *Rosa virginiana*.**
- 6b. Leaflets dull above **Wild Rose, *Rosa humilis*.**
- 7a. Stems trailing or creeping —8.
- 7b. Stems erect, ascending, or arched —9.
- 8a. Stems almost herbaceous, without thorns **Dwarf Raspberry, *Rubus triflorus*.**
- 8b. Stems distinctly shrubby and thorny **Dewberry, *Rubus villosus*.**
- 9a. Ripe fruit dropping away from the white receptacle or core; terminal leaflet of each leaf with a long stalk while the lateral leaflets are sessile or nearly so (8-15 dm. high) **Black Raspberry, *Rubus occidentalis*.**
- 9b. Ripe fruit and receptacle or core dropping together; all leaflets on stalks which are approximately equal in length (1-2 m. high) (Blackberry: several species are known from the vicinity but are distinguished with much difficulty. The commonest is probably *Rubus allegheniensis*)
- 10a. Ovary 1, superior, occupying the center of the flower, with a single style (spring) —11.
- 10b. Ovaries more than 1, superior, occupying the center of the flower and each with its own style —19.
- 10c. Ovary inferior, permanently enclosed within the receptacle and appearing as a small swelling at the summit of the flower-stalk, only the styles appearing within the flower —22.

- 11a. Flowers in racemes (trees or tall shrubs) —12.
 11b. Flowers in small umbels or rounded clusters —13.
 12a. Leaves oblong, the points of their teeth incurved
 Black Cherry, *Prunus serotina*.
 12b. Leaves obovate, the points of their teeth spreading
 Choke Cherry, *Prunus virginiana*.
 13a. Petals 10-16 mm. long (trees) —14.
 13b. Petals 4-6 mm. long —16.
 14a. Leaves with sharp bristle-tipped teeth
 Wild Plum, *Prunus americana*.
 14b. Leaves with blunt teeth tipped with minute dark glands
 (escaped from cultivation) —15.
 15a. Tree with a well developed central trunk, the bark reddish brown,
 exfoliating in thin layers like a birch
 Bird Cherry, *Prunus avium*.
 15b. Spreading tree without a well developed trunk, the bark gray-
 brown and tight
 Sour Cherry, *Prunus Cerasus*.
 16a. Low shrubs; leaves oblong or spatulate, widest distinctly
 above the middle, and with a long tapering base —17.
 16b. Shrubs or trees; leaves broadest at or below the middle, and
 not with a long tapering base —18.
 17a. Erect shrub (5-10 dm. high)
 Appalachian Cherry, *Prunus cuneata*.
 17b. Prostrate or ascending shrub (3-15 dm. high)
 Sand Cherry, *Prunus pumila*.
 18a. Leaves broadly oblong to obovate, barely acute
 Beach Plum, *Prunus maritima*.
 18b. Leaves lanceolate to ovate-lanceolate, acuminate
 Pin Cherry, *Prunus pennsylvanica*.
 19a. Leaves lobed —20.
 19b. Leaves merely toothed (6-20 dm. high; flowers about 5 mm.
 wide, in terminal panicles; summer) —21.
 20a. Flowers showy, purple, 3-4 cm. broad (1-2 m. high; summer)
 Flowering Raspberry, *Rubus odoratus*.
 20b. Flowers white, about 1 cm. wide (1-3 m. high; early summer)
 Ninebark, *Physocarpus opulifolius*.
 21a. Leaves densely hairy beneath (flowers pink)
 Hardhack, *Spiraea tomentosa*.

- 21b. Leaves smooth beneath or very nearly so (flowers white or pink)
Meadow-sweet, Spiraea latifolia.
- 22a. Trees without thorns, escaped from cultivation; flowers pink
 to nearly white, in small clusters, 25-50 mm. wide, spring
Apple, Pyrus Malus.
- 22b. Shrubs or trees, without thorns, and with smaller white flowers
 (spring) —23.
- 22c. Shrubs or trees, with thorns (flowers white, spring) (Haw-
 thorn: the genus *Crataegus*. A large number of species have
 been reported from the vicinity of New York, but their
 identification is always difficult and sometimes impossible
 except by experts).
- 23a. Midvein of the leaf glandular above; flowers in terminal
 branched clusters (shrubs 1-3 m. high; flowers white or pink)
 (Chokeberry) —24.
- 23b. Midvein of the leaf not glandular above; flowers in racemes
 (shrubs or trees, 1-10 m. high; flowers white) (Juneberry)
 —26.
- 24a. Pedicels and calyx smooth **Chokeberry, Pyrus melanocarpa.**
- 24b. Pedicels and calyx hairy —25.
- 25a. Fruit bright red **Chokeberry, Pyrus arbutifolia.**
- 25b. Fruit purple-black
Chokeberry, Pyrus arbutifolia var. atropurpurea.
- 26a. Petals 15-25 mm. long **Juneberry, Amelanchier canadensis.**
- 26b. Petals 5-12 mm. long —27.
- 27a. Leaves coarsely toothed, with about one tooth for each lateral
 vein **Juneberry, Amelanchier spicata.**
- 27b. Leaves finely toothed, with about 2-3 teeth for each lateral vein
Juneberry, Amelanchier oblongifolia.
- 28a. Flowers purple, 2-3 cm. wide (3-9 dm. high; summer) —29.
- 28b. Flowers yellow —30.
- 28c. Flowers white to pink or greenish —42.
- 29a. Leaflets sharply and irregularly toothed or lobed; petals erect,
 narrowed at the base **Purple Avens, Geum rivale.**
- 29b. Leaflets finely and regularly toothed, oblong; petals spreading
Marsh Cinquefoil, Potentilla palustris.
- 30a. Stems creeping or trailing, bearing solitary flowers in the
 axils. Early in spring, when the stems are short, the leaves
 may appear to be all basal —31.

- 30b. Stems leafy, not trailing —33.
- 31a. Leaflets 7-25, silvery beneath (flowers about 2 cm. wide; late spring and summer) **Silver Weed, *Potentilla Anserina*.**
- 31b. Leaflets 5 (flowers about 1 cm. wide; late spring and summer) (Five-finger) —32.
- 32a. Leaflets toothed only near the apex
Five-finger, *Potentilla pumila*.
- 32b. Leaflets toothed from well below the middle
Five-finger, *Potentilla canadensis*.
- 33a. Flowers in irregular or spreading clusters —34.
- 33b. Flowers less than 1 cm. wide in slender terminal spike-like racemes (3-8 dm. high; leaves pinnately compound; summer) (*Agrimony*) —33.
- 34a. Leaves palmately divided into 5-7 leaflets —35.
- 34b. Leaves pinnately divided, or trifoliate (summer) —36.
- 35a. Leaves silvery white beneath, laciniately toothed (1-4 dm. high; flowers 6-8 mm. wide; late spring and summer)
Cinquefoil, *Potentilla argentea*.
- 35b. Leaves green beneath, toothed (3-10 dm. high; flowers about 15 mm. wide, summer) **Cinquefoil, *Potentilla recta*.**
- 36a. Leaflets 3, coarsely toothed, about equal in size (2-8 dm. high; flowers about 10 mm. wide)
Cinquefoil, *Potentilla monspeliensis*.
- 36b. Leaflets, or principal lobes of the leaves, 5 or more (5-15 dm. high) —37.
- 37a. Flowers greenish yellow or cream-yellow, about 6 mm. wide
Avens, *Geum flavum*.
- 37b. Flowers bright yellow, about 1 cm. wide
Avens, *Geum strictum*.
- 38a. Leaves smooth beneath, or with scattered spreading hairs —39.
- 38b. Leaves softly hairy beneath —40.
- 39a. Stem hirsute with rather stiff hairs
Agrimony, *Agrimonia gryposepala*.
- 39b. Stem smooth or with a few scattered hairs
Agrimony, *Agrimonia rostellata*.
- 40a. Principal leaflets 11-15 **Agrimony, *Agrimonia parviflora*.**
- 40b. Principal leaflets 5-9 —41.
- 41a. Whole lower surface of the leaves softly hairy
Agrimony, *Agrimonia mollis*.

- 41b. Only the veins softly hairy, the surface resinous-dotted
Agrimony, *Agrimonia striata*.
- 42a. Leaves all basal, with three leaflets (1-2 dm. high; spring)
(Strawberry) —43.
- 42b. Stem-leaves present —44.
- 43a. Leaflets thick and firm, the petioles and pedicels hairy with
spreading or ascending hairs
Strawberry, *Fragaria virginiana*.
- 43b. Leaflets thin, the petioles and pedicels nearly smooth or with
appressed hairs Strawberry, *Fragaria vesca* var. *americana*.
- 44a. Flowers minute, in dense heads, greenish, without petals (3-5
dm. high; leaflets 9-19, 1-2 cm. long; summer)
Garden Burnet, *Sanguisorba minor*.
- 44b. Flowers small, in dense elongated spikes, white, without petals
(4-15 dm. high; leaflets 7-15, 3-8 cm. long; summer)
Burnet, *Sanguisorba canadensis*.
- 44c. Flowers in panicles, loose clusters, or solitary; petals pres-
ent —45.
- 45a. Leaves all trifoliate (late spring or early summer) —46.
- 45b. Leaves all pinnately compound with 7-11 oval leaflets (5-10 dm.
high; flowers 10-15 mm. wide, in terminal clusters; early sum-
mer)
Cinquefoil, *Potentilla arguta*.
- 45c. Some of the upper leaves merely lobed (4-8 dm. high; sum-
mer) —47.
- 46a. Pistils 5 (5-10 dm. high; flowers white or pink, about 1 cm.
wide)
Bowman's Root, *Gillenia trifoliata*.
- 46b. Pistils many; stems trailing (1-4 dm. high; flowers white)
—8a.
- 46c. Pistils many; stems erect (4-8 dm. high; summer) —47.
- 47a. Stem and petioles bristly-hairy Avens, *Geum virginianum*.
- 47b. Stem softly and finely hairy Avens, *Geum canadense*.

LEGUMINOSAE, the Pulse Family

Herbs, shrubs, or trees, usually with compound alternate leaves and stipules; flowers usually irregular, shaped like a sweet pea, but in some genera small and in others nearly regular; sepals 5; petals 5; stamens 10 (rarely 7 or 5); ovary 1, simple, ripening into a pod.

- 1a. Trees or shrubs —2.
1b. Herbs, some or all of the leaves ending in tendrils for climbing —5.
1c. Herbs, twining, or in the absence of a support sometimes trailing on the ground, in which case the slender flexuous stems, often twined around each other, distinguish them from the following group —11.
1d. Herbs, without tendrils and not twining —16.
2a. Flowers bright yellow, shaped like a sweet pea (introduced shrubs which have become naturalized in a few places) —3.
2b. Flowers deep blue, in dense spikes; leaflets mostly 11-25 (1-3 m. high; late spring) **False Indigo, *Amorpha fruticosa*.**
2c. Flowers showy, white to rose-color, in loose racemes; leaves pinnately compound with numerous leaflets (spring) (Locust) —4.
2d. Flowers greenish, very small, in dense spikes; leaves pinnately compound with numerous leaflets
Honey Locust, *Gleditsia triacanthos*.
3a. Leaves simple, lanceolate, mostly 2-3 cm. long; flowers about 1 cm. long (3-5 dm. high; summer)
Greenweed, *Genista tinctoria*.
3b. Leaves with 3 leaflets each about 1 cm. long; flowers 2-3 cm. long (about 1 m. high; late spring)
Scotch Broom, *Cytisus scoparius*.
4a. A tree, with smooth branches bearing thorns at the base of each leaf; flowers very fragrant
Black Locust, *Robinia Pseudo-Acacia*.
4b. A shrub, with sticky or viscid twigs
Clammy Locust, *Robinia viscosa*.
4c. A shrub with bristly twigs; flowers rose-color, not fragrant
Bristly Locust, *Robinia hispida*.
5a. Stipules less than 10 mm. long and usually less than one-fourth the length of the lowest leaflets; lateral petals of the corolla adherent to the lower ones as far as the middle; style with a tuft of hairs at the apex (flowers purple or bluish, spring and summer) (Vetch) —6.
5b. Stipules more than 8 mm. long and usually one-third or more the length of the lowest leaflets; lateral petals of the corolla free from the lower ones or adherent only at the very base; style

hairy along the upper side (flowers purple or bluish, late spring and summer) —10.

6a. Flowers only 3-5 mm. long; leaflets oblong to obovate or nearly linear —7.

6b. Flowers 10 mm. long or more —8.

7a. Leaflets mostly 6-10, obtuse or acute

Vetch, *Vicia tetrasperma*.

7b. Leaflets 12-16, truncate or notched at the end

Vetch, *Vicia hirsuta*.

8a. Flowers almost sessile, single or 2-3 together in the axils of the upper leaves —9.

8b. Flowers numerous in a raceme, which has a stalk 3-5 cm. long

Vetch, *Vicia Cracca*.

9a. Leaflets of the upper leaves oblong to obovate, truncate or notched at the end

Vetch, *Vicia sativa*.

9b. Leaflets of the upper leaves linear or narrowly lanceolate, acute

Vetch, *Vicia angustifolia*.

10a. Stipules arrow-shaped, with 2 basal lobes; flowers about 2 cm. long; on sea-shores

Beach Pea, *Lathyrus maritimus*.

10b. Stipules half-arrow-shaped, with a single basal lobe; flowers about 1 cm. long; in wet ground

Marsh Pea, *Lathyrus palustris*.

11a. Leaflets 5-7, ovate-lanceolate; flowers brownish purple, about 1 cm. long (summer)

Ground-nut, *Apios tuberosa*.

11b. Leaflets three —12.

12a. Flowers about 5 cm. long, pale blue; leaflets oblong-ovate (summer)

Butterfly Pea, *Clitoria mariana*.

12b. Flowers 8-15 mm. long (summer) —13.

13a. The 2 lower petals, which enclose the stamens, nearly straight (stems hairy; leaflets ovate; flowers purplish or white) (Hog Peanut) —14.

13b. The 2 lower petals strongly curved upward, but not twisted (leaflets ovate-lanceolate, often obscurely lobed; flowers pink or purple or greenish) (Wild Bean) —15.

13c. The 2 lower petals twisted into a spiral (leaflets broadly ovate; flowers purple)

Wild Bean, *Phaseolus polystachyus*.

14a. Leaflets mostly 2-5 cm. long

Hog Peanut, *Amphicarpa monoica*.

- 14b. Leaflets mostly 5-10 cm. long
Hog Peanut, *Amphicarpa Pitcheri*.
- 15a. Most of the leaflets shallowly lobed; stem from fibrous roots
Wild Bean, *Strophostyles helvola*.
- 15b. Leaflets rarely lobed; stems from an underground rootstock
Wild Bean, *Strophostyles umbellata*.
- 16a. Leaves simple, oblong-lanceolate; flowers yellow, about 1 cm. long (3-6 dm. high; summer)
Rattle-box, *Crotalaria sagittalis*.
- 16b. Leaves compound with 3 leaflets —17.
- 16c. Leaves palmately compound with 7-11 leaflets; flowers blue, about 15 mm. long, in a long raceme (3-6 dm. high; late spring)
Lupine, *Lupinus perennis*.
- 16d. Leaves pinnately compound, with 5 or more leaflets —64.
- 17a. Flowers bright blue or violet, about 6 mm. long, in crowded racemes; leaflets toothed (3-6 dm. high; summer)
Alfalfa, *Medicago sativa*.
- 17b. Flowers pale blue, about 5 cm. long (stems prostrate or reclining) —12a.
- 17c. Flowers yellow —18.
- 17d. Flowers white to purple or red or intermediate shades —25.
- 17e. Flowers cream-color, with a small purple spot on the largest (upper) petal, small, in dense heads (5-12 dm. high; late summer) (Bush Clover) —62.
- 18a. Leaflets finely denticulate —19.
- 18b. Leaflets completely entire —23.
- 19a. Flowers in a loose elongate raceme (1-2 m. high; summer)
Yellow Sweet Clover, *Medilotus officinalis*.
- 19b. Flowers in heads, umbels, or short dense spikes —20.
- 20a. Each individual flower (not the head of flowers) only about 2 mm. long; pods coiled (stems decumbent or spreading, 3-6 dm. long; spring and summer)
Black Medick, *Medicago lupulina*.
- 20b. Each flower 3-6 mm. long (1-4 dm. high; spring and summer) (Hop Clover) —21.
- 21a. Leaflets all sessile; heads densely flowered
Hop Clover, *Trifolium agrarium*.
- 21b. Terminal leaflet stalked —22.

22a. Flowers normally 20 or more in each head

Hop Clover, *Trifolium procumbens*.

22b. Flowers normally 10 or fewer in each umbel-like head

Hop Clover, *Trifolium dubium*.

23a. Stipules nearly as large as the lower leaflets, so that the leaf appears to have 5 leaflets (stems spreading or prostrate, 2-5 dm. long; flowers 15 mm. long, in a stalked umbel, summer)

Bird's-foot Trefoil, *Lotus corniculatus*.

23b. Stipules minute or none, much smaller than the leaflets —24.

24a. Flowers pedicelled, in a raceme, about 15 mm. long; leaflets obovate (6-12 dm. high; summer)

Wild Indigo, *Baptisia tinctoria*.

24b. Flowers nearly sessile, about 8 mm. long; leaflets linear-oblong (2-6 dm. high; summer)

Pencil Flower, *Stylosanthes biflora*.

25a. Leaflets finely toothed —26.

25b. Leaflets all entire —30.

26a. Flowers small, white, in slender racemes (1-3 m. high; summer)

Sweet Clover, *Melilotus alba*.

26b. Flowers in heads or short dense spikes (late spring and summer) (Clover) —27.

27a. Heads of flowers conspicuously longer than wide, on distinct stalks; stems erect —28.

27b. Heads of flowers globose or slightly ovoid, sessile and closely surrounded by leaves (3-6 dm. high; flowers red-purple or magenta)

Red Clover, *Trifolium pratense*.

27c. Heads of flowers globose or nearly so, on distinct stalks; each individual flower on a pedicel —29.

28a. Leaflets obovate; corolla crimson, about 1 cm. long and much longer than the sepals (4-10 dm. high)

Crimson Clover, *Trifolium incarnatum*.

28b. Leaflets oblanceolate; corolla whitish, small, shorter than the sepals (1-4 dm. high)

Stone Clover, *Trifolium arvense*.

29a. Stems prostrate or creeping (flower-stalks erect, 1-2 dm. high; flowers white)

White Clover, *Trifolium repens*.

29b. Stems erect or ascending, not creeping (3-6 dm. high; flowers pink to white)

Alsike Clover, *Trifolium hybridum*.

30a. Racemes terminal or a few of them only axillary, usually long; leaflets generally more than 3 cm. long; pod (usually to be

seen at the base of the raceme) transversely segmented into 2 or more joints (summer) (Tick Trefoil, the genus *Desmodium*. Pods are generally necessary for satisfactory identification, and reference to a Manual is recommended.) —31.

30b. Racemes short, loose, chiefly axillary; leaflets generally less than 3 cm. long; pods short, ovate or ovoid and not transversely jointed (summer) (Bush Clover, the genus *Lespedeza*. Reference to a Manual is recommended.) —54.

30c. Raceme rising on a long leafless stalk from the base of the plant (4-8 dm. high; leaflets oval)

Tick Trefoil, *Desmodium nudiflorum*.

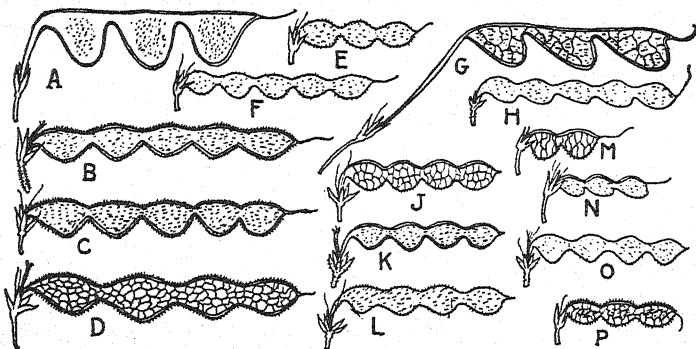


FIG. 22. Fruits of Tick Trefoil, natural size. A. *Desmodium grandiflorum*; B. *D. canescens*; C. *D. canadense*; D. *D. bracteosum*; E. *D. sessilifolium*; F. *D. Dillenii*; G. *D. nudiflorum*; H. *D. paniculatum*; J. *D. viridiflorum*; K. *D. laevigatum*; L. *D. rotundifolium*; M. *D. strictum*; N. *D. rigidum*; O. *D. humifusum*; P. *D. marilandicum*.

31a. Leaves closely clustered near the summit of the stem (4-12 dm. high; leaflets ovate) **Tick Trefoil, *Desmodium grandiflorum*.**

31b. Leaves scattered along the stem —32.

32a. Stems prostrate or reclining, 8-25 dm. long —33.

32b. Stem erect or nearly so —34.

33a. Stipules ovate; plant softly hairy; leaflets nearly circular in outline **Tick Trefoil, *Desmodium rotundifolium*.**

33b. Stipules lanceolate or linear; plant nearly smooth; leaflets ovate **Tick Trefoil, *Desmodium glabellum*.**

- 34a. Stipules ovate or lanceolate, persistent, often 1 cm. long or more (6-15 dm. high) —35.
- 34b. Stipules narrowly lanceolate or subulate, less than 1 cm. long, frequently fallen by flowering-time —36.
- 35a. Stems smooth; leaflets ovate-lanceolate, acuminate
Tick Trefoil, *Desmodium bracteosum*.
- 35b. Stems hairy; leaflets ovate, obtuse or barely acute
Tick Trefoil, *Desmodium canescens*.
- 36a. Key for use when ripe or nearly ripe pods are available —37.
- 36b. Key for use with leaves and flowers only —47.
- 37a. Pod raised above the persistent calyx on a stalk about half as long as the lower joint of the pod, or longer —38.
- 37b. Pod sessile in the calyx, or on a very short stalk —41.
- 38a. Leaves smooth; stem smooth or nearly so —39.
- 38b. Leaves softly hairy beneath; stem usually hairy also —40.
- 39a. Terminal leaflet ovate, about half as long as wide
Tick Trefoil, *Desmodium laevigatum*.
- 39b. Terminal leaflet narrowly oblong, 4-6 times as long as wide
Tick Trefoil, *Desmodium paniculatum*.
- 40a. Lower side of each joint of the pod rounded in outline
Tick Trefoil, *Desmodium viridiflorum*.
- 40b. Lower side of each joint of the pod bluntly triangular in outline
Tick Trefoil, *Desmodium Dilleni*.
- 41a. Each flower 10-12 mm. long; stem hairy
Tick Trefoil, *Desmodium canadense*.
- 41b. Each flower only 3-6 mm. long —42.
- 42a. Terminal leaflets narrowly oblong to linear, 4 or more times as long as wide —43.
- 42b. Terminal leaflet ovate to rounded, seldom more than twice as long as wide —45.
- 43a. Petiole (measured from the stem to the stalk of the lower leaflets) about a tenth as long as the terminal leaflet
Tick Trefoil, *Desmodium sessilifolium*.
- 43b. Petiole a fourth to a half as long as the terminal leaflet —44.
- 44a. Joints of the pod rounded in general outline; leaflets linear, very strongly veined (plant of the Pine Barrens)
Tick Trefoil, *Desmodium strictum*.

- 44b. Joints of the pod triangular in general outline; leaflets narrowly lanceolate (common species)

Tick Trefoil, *Desmodium paniculatum*.

- 45a. Terminal leaflet, in average leaves, only 1-2.5 cm. long —46.

- 45b. Terminal leaflet in average leaves 3-6 cm. long

Tick Trefoil, *Desmodium rigidum*.

- 46a. Stem and leaves smooth or nearly so

Tick Trefoil, *Desmodium marilandicum*.

- 46b. Stem and leaves conspicuously hairy

Tick Trefoil, *Desmodium obtusum*.

- 47a. Flowers 10-12 mm. long and the stem hairy —41a.

- 47b. Flowers 3-8 mm. long, or if larger, then the stems smooth —48.

- 48a. Terminal leaflet narrowly oblong to linear, 4 or more times as long as wide —43.

- 48b. Terminal leaflet ovate, oblong, or rounded, very rarely more than 3 times as long as wide —49.

- 49a. Leaves smooth, or minutely hairy on the veins beneath; stem smooth or nearly so —50.

- 49b. Leaves conspicuously hairy beneath —52.

- 50a. Terminal leaflet 1-2.5 cm. long —46a.

- 50b. Terminal leaflet 3-6 cm. long —51.

- 51a. Petiole nearly or quite as long as the lower leaflets —39a.

- 51b. Petiole about half as long as the lower leaflets —45b.

- 52a. Terminal leaflet 1-2.5 cm. long —46b.

- 52b. Terminal leaflet 3-8 cm. long —53.

- 53a. Terminal leaflet rhombic-ovate, velvety beneath —40a.

- 53b. Terminal leaflet ovate-oblong to ovate, thinly hairy beneath —40b.

- 54a. Stalks of the flower-clusters all shorter than the subtending leaves (3-10 dm. high) —55.

- 54b. Stalks of the flower-clusters all or mostly conspicuously longer than the subtending leaves —58.

- 55a. Stems downy with short spreading hairs

Bush Clover, *Lespedeza Stuevei*.

- 55b. Stems with appressed hairs or nearly smooth —56.

- 56a. Leaflets nearly linear, about 6 times as long as wide

Bush Clover, *Lespedeza virginica*.

- 56b. Leaflets oblong or ovate, 2-4 times as long as wide —57.

- 57a. Calyx 6-8 mm. long

Bush Clover, *Lespedeza simulata*.

- 57b. Calyx 3-4 mm. long

Bush Clover, *Lespedeza frutescens*.

- 58a. Stems prostrate or trailing, 2-8 dm. long —59.
 58b. Stems erect or ascending, 3-10 dm. high —60.
 59a. Stems with short spreading hairs
 Bush Clover, *Lespedeza procumbens*.
 59b. Stems with appressed hairs or nearly smooth
 Bush Clover, *Lespedeza repens*.
 60a. Leaves woolly beneath **Bush Clover, *Lespedeza Brittonii*.**
 60b. Leaves with appressed or spreading hairs beneath —61.
 61a. Flowers mostly 2-6 in each raceme; stems nearly smooth
 Bush Clover, *Lespedeza violacea*.
 61b. Flowers more numerous in each raceme; stems with spreading hairs
 Bush Clover, *Lespedeza Nuttallii*.
 62a. Leaflets less than twice as long as wide
 Bush Clover, *Lespedeza hirta*.
 62b. Leaflets more than twice as long as wide —63.
 63a. Leaflets narrowly elliptical, the principal ones more than 5 mm. wide; heads of flowers sessile or nearly so
 Bush Clover, *Lespedeza capitata*.
 63b. Leaflets linear, 5 mm. wide or less; flower-heads conspicuously stalked
 Bush Clover, *Lespedeza angustifolia*.
 64a. The 5 petals all nearly alike in size and shape; leaflets 12 or more; flowers yellow (summer) —65.
 64b. Petals very irregular in size and shape, the uppermost one much the largest —67.
 65a. Leaflets lanceolate-oblong, 2-5 cm. long; 7 stamens with normal anthers and 3 with imperfect anthers; flowers about 15 mm. wide (8-15 dm. high) **Wild Senna, *Cassia marilandica*.**
 65b. Leaflets linear-oblong, 2 cm. long or less; stamens 5 or 10 (3-6 dm. high) (Partridge Pea) —66.
 66a. Flowers 2-4 cm. wide; anthers 10
 Partridge Pea, *Cassia Chamaecrista*.
 66b. Flowers 5-10 mm. wide; anthers 5
 Partridge Pea, *Cassia nictitans*.
 67a. Leaflets 5; flowers bright yellow, in umbels —23a.
 67b. Leaflets numerous; flowers rose-color, in crowded umbels (stems 3-6 dm. long, ascending or spreading; summer)
 Coronilla, *Coronilla varia*.
 67c. Leaflets numerous; flowers yellowish white with purple markings,

in a terminal raceme (3-6 dm. high; early summer)

Goat's Rue, *Tephrosia virginiana*.

LINACEAE, the Flax Family

Erect herbs, branching above, with simple leaves and regular flowers, having 5 sepals, 5 yellow or blue, separate petals, 5 stamens, and usually 5 styles.

1a. Flowers blue, about 15 mm. wide (3-6 dm. high; leaves lanceolate; summer) **Flax, *Linum usitatissimum*.**

1b. Flowers yellow, smaller (3-8 dm. high; leaves lanceolate, narrowly oblong, or linear; summer) (Wild Flax) —2.

2a. Principal stem-leaves opposite **Wild Flax, *Linum striatum*.**

2b. Principal stem-leaves alternate —3.

3a. Styles united to about the middle; upper branches angular or grooved **Wild Flax, *Linum sulcatum*.**

3b. Styles separate to the base; branches cylindrical or nearly so —4.

4a. Sepals all entire **Wild Flax, *Linum virginianum*.**

4b. Sepals, either all or some of them, glandular-toothed —5.

5a. Capsule depressed-globose, its diameter greater than its height **Wild Flax, *Linum medium*.**

5b. Capsule ovoid, its height greater than its diameter **Wild Flax, *Linum floridanum*.**

OXALIDACEAE, the Wood Sorrel Family

Low herbs, sour to the taste, with alternate or basal compound leaves with 3 reverse heart-shaped leaflets; sepals 5; petals 5, separate; stamens 10; styles 5, separate (Wood Sorrel).

1a. Flowers pink-purple, 10-15 mm. wide; leaves all basal (1-2 dm. high; late spring) **Wood Sorrel, *Oxalis violacea*.**

1b. Flowers yellow; styles leafy (spring and all summer) —2.

2a. Stem prostrate and creeping **Wood Sorrel, *Oxalis repens*.**

2b. Stems erect or nearly so (1-5 dm. high) —3.

3a. Flower-stalks bearing several flowers; pedicels sparsely hairy with spreading hairs **Wood Sorrel, *Oxalis corniculata*.**

3b. Flower-stalks mostly with only 2 flowers; pedicels hairy with appressed hairs —4.

- 4a. Stem covered with appressed hairs

Wood Sorrel, *Oxalis stricta*.

- 4b. Stem covered with spreading or woolly hairs

Wood Sorrel, *Oxalis filipes*.

GERANIACEAE, the Geranium Family

Herbs with deeply lobed or divided leaves; flowers regular, with 5 separate petals, 5 sepals, 5 or 10 stamens, and a 5-celled ovary.

- 1a. Flowers 25 mm. wide or more, pink-purple (3-6 dm. high; spring)

Wild Geranium, *Geranium maculatum*.

- 1b. Flowers not more than 15 mm. wide, usually about 10 mm. —2.

- 2a. Leaves pinnately dissected (2-4 dm. high; flowers pink-purple, 10 mm. wide, spring and summer)

Stork's-bill, *Erodium cicutarium*.

- 2b. Leaves ternately divided, the lobes pinnatifid (2-4 dm. high; flowers purple, late spring and summer)

Herb Robert, *Geranium Robertianum*.

- 2c. Leaves palmately 5-11-lobed (1-5 dm. high; summer) (Crane's-bill) —3.

- 3a. Petals white or pale pink; flowers in compact clusters

Crane's-bill, *Geranium carolinianum*.

- 3b. Petals pink-purple; flowers in pairs in loose clusters

Crane's-bill, *Geranium Bicknellii*.

Several other species of *Geranium* may occasionally be seen in waste places and along roadsides.

RUTACEAE, the Rue Family

Shrubs or low trees, with compound leaves frequently dotted with translucent glands, visible when the leaf is held to the light; flowers small, often imperfect, greenish white, with 3-5 sepals, petals, and stamens.

- 1a. Leaflets 5-9; stems thorny (2-4 m. high; spring)

Prickly Ash, *Zanthoxylum americanum*.

- 1b. Leaflets 3; stems not thorny (2-5 m. high; early summer)

Hop Tree, *Ptelea trifoliata*.

SIMARUBACEAE, the Quassia Family

Trees, with pinnately compound leaves and small greenish yellow flowers in large panicles in early summer, ripening into winged fruits.

1. Leaflets mostly 11-25, glandular at the margin near the base (early summer) **Tree of Heaven, *Ailanthus glandulosa*.**

POLYGALACEAE, the Milkwort Family

Small herbs, with alternate, opposite, or whorled simple leaves, and small irregular flowers; sepals 5, 2 of them resembling petals; stamens 6 or 8, more or less united with each other and with the petals.

- 1a. Flowers orange-yellow in ovoid spikes or heads (2-3 dm. high; leaves oblanceolate; summer) **Milkwort, *Polygala lutea*.**
- 1b. Flowers purple, pink, greenish, or white —2.
- 2a. Some or all of the leaves in whorls (1-4 dm. high; summer) —3.
- 2b. All of the leaves alternate —5.
- 3a. Spikes borne on stalks above the uppermost leaves —4.
- 3b. Spikes sessile, ovoid to nearly globose, obtuse (leaves in fours, oblanceolate) **Milkwort, *Polygala cruciata*.**
- 4a. Spikes blunt, about 1 cm. thick (leaves oblanceolate) **Milkwort, *Polygala brevifolia*.**
- 4b. Spikes slender and tapering to the top, about 5 mm. thick (leaves linear) **Milkwort, *Polygala verticillata*.**
- 5a. Flowers 15-20 mm. long, rose-color or white, in loose clusters of 1-4 (1-4 dm. high; leaves ovate; late spring and early summer) **Flowering Wintergreen, *Polygala paucifolia*.**
- 5b. Flowers much smaller, in spikes, heads, or racemes (summer) —6.
- 6a. Flowers in a loose raceme, the pedicels usually about 3 mm. long (2-5 dm. high; flowers rose or purple; subterranean flowers produced; leaves narrowly oblong or oblanceolate) **Milkwort, *Polygala polygama*.**
- 6b. Flowers in a short, thick, obtuse, very dense, head-like spike (2-4 dm. high; flowers purple or greenish) —7.
- 6c. Flowers in a slender or conic, usually tapering or acute spike about 4 mm. thick (1-2 dm. high; flowers dull purple, greenish, or nearly white; leaves linear) **Milkwort, *Polygala Nuttallii*.**
- 7a. Leaves oblong-linear; flowers bright reddish purple, in spikes about 1 cm. thick **Milkwort, *Polygala sanguinea*.**
- 7b. Leaves narrowly linear; flowers pale pink-purple, in spikes about 6 mm. thick **Milkwort, *Polygala mariana*.**

EUPHORBIACEAE, the Spurge Family

Herbs with alternate, opposite, or whorled leaves and usually milky juice. Individual flowers small or minute and inconspicuous, without petals and frequently also without sepals. In our commoner species, a small cluster of several staminate flowers, each consisting of one stamen only, and 1 pistillate flower, consisting of a single pedicelled 3-lobed ovary only, are included within a 4-5-lobed involucre, which is sometimes colored and then resembles a calyx or corolla, so that it may easily be mistaken for a single flower.

- 1a. Leaves silvery beneath, linear or nearly so (erect, 1-4 dm. high, with minute greenish flowers in very small terminal stalked clusters; summer) **Crotonopsis, Crotonopsis linearis.**

- 1b. Leaves not silvery beneath —2.

- 2a. Stem-leaves all alternate; inflorescence axillary; pistillate flowers subtended by leaf-like lobed bracts; flowers with calyx and several stamens (3-8 dm. high; flowers greenish or purplish, summer) (Three-seeded Mercury) —3.

- 2b. Stem-leaves alternate; inflorescence a terminal, open or umbel-like cluster, with its branches subtended by opposite or whorled leaves; individual flowers as described for the family (Spurge) —8.

- 2c. Stem-leaves opposite; flowers as described for the family —4.

- 3a. Leaves ovate or ovate-lanceolate; flower-clusters shorter than the subtending bracts

Three-seeded Mercury, Acalypha virginica.

- 3b. Leaves lanceolate to oblong; flower-clusters equaling or exceeding the subtending bracts

Three-seeded Mercury, Acalypha gracilens.

- 4a. The apparent flowers in short-stalked or nearly sessile axillary clusters (summer and autumn) (Spurge) —5.

- 4b. Each apparent flower at the end of a stalk 15-25 mm. long —9b.

- 5a. Stem and foliage hairy (prostrate or ascending; stems 1-4 dm. long; leaves oblong to ovate) —6.

- 5b. Stem and foliage smooth —7.

- 6a. Seeds black

Spurge, Euphorbia hirsuta.

- 6b. Seeds red or reddish brown

Spurge, Euphorbia maculata.

- 7a. Stems erect or ascending; leaves all alike, oblong, finely toothed (2-6 dm. high) *Spurge, Euphorbia Preslii.*
- 7b. Stems erect or ascending; leaves of two forms on each plant, entire —10.
- 7c. Stems prostrate; leaves all alike, entire, linear-oblong (on sea-beaches) *Spurge, Euphorbia polygonifolia.*
- 8a. Apparent flowers (really involucre) with 4 or 5 conspicuous white petal-like appendages (4-10 dm. high; summer) *Spurge, Euphorbia corollata.*
- 8b. Apparent flowers without white petal-like appendages —9.
- 9a. Apparent flowers (involucre) closely subtended by leaves or leaf-like bracts —10.
- 9b. Apparent flowers solitary or very few together, at the end of a slender stalk 15-25 mm. long *Spurge, Euphorbia Ipecacuanhae.*
- 10a. Stem-leaves all narrowly linear (2-4 dm. high; spring and summer) *Spurge, Euphorbia Cyparissias.*
- 10b. Stem-leaves oblong, with a broad, sessile, more or less heart-shaped base (2-8 dm. high; spring and summer) *Spurge, Euphorbia Lathyris.*
- 10c. Stem-leaves oblong to obovate, tapering to the base (1-3 dm. high; summer) —11.
- 11a. Stem-leaves finely toothed *Spurge, Euphorbia Helioscopia.*
- 11b. Stem-leaves all entire *Spurge, Euphorbia Peplus.*

CALLITRICHACEAE, the Water Starwort Family

Small herbs growing in water, mud, or damp soil, with opposite entire leaves and small inconspicuous axillary flowers with neither calyx nor corolla (stems 2-20 cm. long; summer) (Water Starwort).

- 1a. Leaves beset with minute star-shaped scales; floating and aerial leaves obovate, submerged leaves linear *Water Starwort, Callitriche palustris.*
- 1b. Leaves without star-shaped scales —2.
- 2a. Submerged aquatic plant; leaves linear, 5-10 mm. long *Water Starwort, Callitriche autumnalis.*
- 2b. Terrestrial plant; leaves narrowly obovate, 2-4 mm. long *Water Starwort, Callitriche deflexa var. Austini.*

EMPETRACEAE, the Crowberry Family

Low evergreen shrubs; flowers in terminal heads, without calyx or corolla.

1. Leaves linear, about 5 mm. long; flowers in spring, with long and conspicuous purple filaments (Pine Barrens; 2-5 dm. high; spring)
Broom Crowberry, *Corema Conradii*.

LIMNANTHACEAE, the False Mermaid Family

Low herbs with alternate compound leaves of 3 or 5 leaflets and minute axillary flowers; sepals 3; petals 3; stamens 6.

1. Stem 1-3 dm. long; flowers minute, white, spring
False Mermaid, *Floerkea proserpinacoides*.

ANACARDIACEAE, the Cashew Family

Shrubs, vines, or small trees, with milky or resinous juice, sometimes poisonous to the touch, alternate, compound leaves and small clustered greenish or yellowish flowers in summer.

- 1a. Leaflets 3, ovate (poisonous climbing or trailing vine; flowers in axillary panicles; late spring)

Poison Ivy, *Rhus Toxicodendron*.

- 1b. Leaflets 7 or more, oblong or lanceolate (shrubs or small trees) —2.

- 2a. Leaflets entire; flowers in axillary panicles (poisonous swamp shrub; summer)

Poison Sumach, *Rhus Vernix*.

- 2b. Leaflets toothed; flowers in crowded terminal panicles (summer) (Sumach) —3.

- 3a. Axis of the leaf winged between the leaflets

Sumach, *Rhus copallina*.

- 3b. Axis of the leaf not winged —4.

- 4a. Bark of the older stems smooth

Sumach, *Rhus glabra*.

- 4b. Bark of the older stems densely velvety-hairy

Sumach, *Rhus typhina*.

AQUIFOLIACEAE, the Holly Family

Shrubs or small trees, with alternate, simple, oblanceolate to elliptical or obovate leaves and small white or greenish axillary flowers in late spring and early summer; sepals, petals, and stamens each 4-6; fruit a berry.

- 1a. Leaves evergreen, with spiny teeth **Holly, *Ilex opaca*.**
 1b. Leaves evergreen, leathery, shining, not spiny
Inkberry, *Ilex glabra*.
 1c. Leaves deciduous, neither leathery nor spiny —2.
 2a. Flowers on pedicels 10 mm. or more long —3.
 2b. Flowers nearly or quite sessile **Black Alder, *Ilex verticillata*.**
 3a. Leaves finely toothed; petals narrowly obovate
Winterberry, *Ilex laevigata*.
 3b. Leaves nearly or quite entire; petals linear
Mountain Holly, *Nemopanthes mucronata*.

CELASTRACEAE, the Staff Tree Family

Shrubs with simple, ovate-lanceolate to oblong leaves and inconspicuous greenish or reddish flowers; sepals and petals each 4 or 5, the stamens of the same number and attached to a disk which fills the center of the flower; fruit showy, orange and red.

- 1a. Leaves alternate; twining vine; flowers in terminal clusters (late spring)
Bittersweet, *Celastrus scandens*.
 1b. Leaves opposite (shrubs 1-4 m. high; flowers in axillary clusters, early summer) —2.
 2a. Leaves with petioles about 10 mm. long
Burning Bush, *Evonymus atropurpureus*.
 2b. Leaves nearly or quite sessile
Strawberry Bush, *Evonymus americanus*.

STAPHYLEACEAE, the Bladder Nut Family

Shrubs, with opposite trifoliate leaves and small axillary clusters of white flowers in late spring; sepals, petals, and stamens each 5; ovary 3-celled, ripening into a large inflated pod.

1. Leaflets narrowly ovate, finely toothed
Bladder Nut, *Staphylea trifolia*.

ACEACEAE, the Maple Family

Trees or tall shrubs, with opposite, palmately lobed or compound leaves and inconspicuous flowers; sepals about 5; petals the same number or none; stamens 4-12; ovary 2-lobed, ripening into a pair of winged fruits.

- 1a. Trees; leaves 3-7 lobed, the margins of the lobes entire or incised, but never regularly toothed —2.

- 1b. Shrubs or small trees; leaves 3-5-lobed, the lobes with regularly toothed margins (flowers greenish yellow, appearing after the leaves in late spring) —5.
- 1c. Leaves compound, usually with 3-5 leaflets (spring, flowering before the leaves open) **Box Elder, *Acer Negundo*.**
- 2a. Angles between the leaf-lobes rounded (flowers greenish yellow, appearing with the leaves) —3.
- 2b. Angles between the lobes acute or obtuse, but not rounded (flowers purple, red, or yellowish, appearing before the leaves) —4.
- 3a. Leaves smooth on the surface beneath **Sugar Maple, *Acer saccharum*.**
- 3b. Leaves downy beneath **Black Maple, *Acer saccharum* var. *nigrum*.**
- 4a. Middle leaf-lobe usually more than half the length of the leaf, narrowed at its base; broken twigs with a strong odor; petals none **Silver Maple, *Acer saccharinum*.**
- 4b. Middle leaf-lobe usually less than half the length of the leaf, its sides parallel or broadened at the base; broken twigs without strong odor; petals present **Red Maple, *Acer rubrum*.**
- 5a. Flower-clusters drooping; leaves finely and sharply toothed, with about 6-10 teeth per centimeter of margin **Moosewood, *Acer pennsylvanicum*.**
- 5b. Flower-clusters erect; leaves coarsely toothed, with about 2-3 teeth per centimeter of margin **Mountain Maple, *Acer spicatum*.**

BALSAMINACEAE, the Touch-me-not Family

Herbs with smooth, alternate, ovate, crenate leaves and showy irregular flowers; sepals 3, one of them petal-like and prolonged backward into a wide spur or pouch; petals 5; stamens 5 (5-10 dm. high; summer) (Touch-me-not).

- 1a. Flowers orange-yellow, thickly spotted with red-brown; spur longer than thick, conical, acute, with a slender tail of half its length **Touch-me-not, *Impatiens biflora*.**
- 1b. Flowers pale yellow, sparsely dotted with brown; spur about as thick as long, obtuse, with a very short tail **Touch-me-not, *Impatiens pallida*.**

RHAMNACEAE, the Buckthorn Family

Shrubs or small trees, with simple, alternate, or rarely opposite leaves and small flowers in axillary or terminal clusters in early summer; sepals, petals, and stamens each 4 or 5, or petals none.

1a. Flowers white, in rounded terminal clusters; fruit dry (leaves ovate; 4-8 dm high) **New Jersey Tea, *Ceanothus americanus*.**

1b. Flowers greenish, often unisexual, in axillary clusters; fruit a berry (leaves ovate, oblong, or obovate; 1-3 m. high) (**Buckthorn**)—2.

2a. Leaves entire or very obscurely wavy-margined; parts of the flower in fives **Buckthorn, *Rhamnus Frangula*.**

2b. Leaves distinctly toothed —3.

3a. Principal lateral veins 6 or 7 on each side of the midvein; petals none; sepals and stamens 5 each

Buckthorn, *Rhamnus alnifolia*.

3b. Principal lateral veins 2 to 4 on each side of the midvein; sepals, petals, and stamens each 4 **Buckthorn, *Rhamnus cathartica*.**

VITACEAE, the Grape Family

Shrubs, climbing by tendrils or hold-fast organs, with alternate, toothed, palmately lobed or palmately compound leaves and small greenish flowers in panicles or flattened clusters; petals, sepals, and stamens each 4 or 5; fruit a berry.

1a. Leaves compound, with usually 5 oblong-lanceolate leaflets (summer) (**Virginia Creeper**)—2.

1b. Leaves simple (late spring) (**Grape**)—3.

2a. Branches of the tendrils chiefly ending in adhesive disks **Virginia Creeper, *Pseuderacanthus quinquefolia*.**

2b. Branches of the tendrils twining, or rarely with a few disks **Virginia Creeper, *Pseuderacanthus vitacea*.**

3a. Leaves woolly beneath —4.

3b. Leaves smooth beneath when mature, or hairy on the veins only —5.

4a. A tendril or flower-cluster opposite each leaf

Grape, *Vitis labrusca*.

4b. No tendril opposite each third leaf **Grape, *Vitis aestivalis*.**

5a. Leaves coarsely toothed, not lobed or slightly 3-lobed

Grape, *Vitis cordifolia*.

5b. Leaves sharply toothed, prominently lobed **Grape, *Vitis vulpina*.**

TILIACEAE, the Linden Family

Trees with alternate, simple, palmately veined leaves and clusters of white fragrant flowers in late spring arising from the middle of an oblong leaf-like bract; sepals and petals each 5; stamens numerous, but united into 5 sets.

1a. Leaves smooth beneath

Basswood, *Tilia americana*.

1b. Leaves hairy beneath

Basswood, *Tilia Michauxii*.

MALVACEAE, the Mallow Family

Herbs with alternate leaves; sepals and petals each 5; stamens numerous, united by their filaments to form a tube surrounding the styles; ovary many-celled; styles 5 to many.

1a. Flowers about 10 cm. wide, white to pink with a crimson center (1-2 m. high; leaves ovate; summer)

Rose Mallow, *Hibiscus oculiroseus*.

1b. Flowers 3-5 cm. wide, pale yellow, with a dark center (3-6 dm. high; leaves deeply palmately lobed; summer)

Flower-of-an-hour, *Hibiscus Trionum*.

1c. Flowers white to red or blue, never yellow — 2.

1d. Flowers yellow (summer) — 7.

2a. Flowers 100 mm. wide or more (1-2 m. high; leaves ovate; summer)

Rose Mallow, *Hibiscus Moscheutos*.

2b. Flowers 25-60 mm. wide (summer) — 3.

2c. Flowers 15 mm. wide or slightly less; leaves round-heart-shaped, shallowly lobed and also crenate or toothed — 6.

3a. Calyx subtended by 6 or more bractlets (6-10 dm. high; leaves ovate, toothed and often 3-lobed) — 4.

3b. Calyx subtended by 3 bractlets (3-6 dm. high) — 5.

4a. Styles 15-20

Marsh Mallow, *Althaea officinalis*.

4b. Styles 5

Kosteletzkya, *Kosteletzkya virginica*.

5a. Leaves divided nearly to the base, the lobes deeply pinnatifid

Mallow, *Malva moschata*.

5b. Leaves lobed about half their length, the lobes toothed or incised

Mallow, *Malva Alcea*.

6a. Stems spreading on the ground, only their tips ascending (spring to fall)

Mallow, *Malva rotundifolia*.

6b. Stems erect, 1 m. high or more

Mallow, *Malva verticillata*.

- 7a. Leaves broadly heart-shaped (8-15 dm. high; flowers about 15 mm. wide) **Velvet Leaf, Abutilon Theophrasti.**
 7b. Leaves ovate-lanceolate (3-6 dm. high; flowers 6-8 mm. wide) **Sida, Sida spinosa.**

HYPERICACEAE, the St. John's-wort Family

Herbs or shrubs, with opposite sessile entire leaves dotted with translucent glands; flowers usually yellow (or pink); sepals and petals 4 or 5; stamens 5-many; ovary with 2-5 styles (summer).

1a. Petals 4, yellow (2-5 dm. high) —2.

1b. Petals 5 —3.

2a. Leaves elliptical, rounded at base and somewhat clasping the stem; flowers about 2 cm. wide; petals obovate

St. Peter's-wort, Ascyrum stans.

2b. Leaves oblong or narrowly obovate, tapering to the base; flowers about 15 mm. wide; petals narrowly oblong

St. Andrew's Cross, Ascyrum hypericoides.

3a. Petals yellow (St. John's-wort) —4.

3b. Petals pink or greenish purple (3-5 dm. high; leaves ovate-oblong, often slightly clasping at base; flowers 15 mm. wide)

Marsh St. John's-wort, Hypericum virginicum.

4a. Flowers 8-25 mm. wide; stamens 15 or more —5.

4b. Flowers 2-10 mm. wide; stamens 12 or fewer —10.

5a. Petals marked with black lines or dots (4-8 dm. high) —6.

5b. Petals not marked with black —7.

6a. Upper part of the stem marked with two fine opposite longitudinal ridges; principal leaves usually less than 3 cm. long

St. John's-wort, Hypericum perforatum.

6b. Upper part of the stem round; principal leaves usually more than 3 cm. long **St. John's-wort, Hypericum punctatum.**

7a. A shrub, up to 2 m. high, with linear leaves rarely more than 5 mm. wide **St. John's-wort, Hypericum densiflorum.**

7b. Herbs, usually 2-6 dm. high; leaves narrowly oblong to elliptical or ovate, the principal ones more than 5 mm. wide —8.

8a. Principal leaves 4-7 cm. long, narrowly oblong

St. John's-wort, Hypericum adpressum.

8b. Principal leaves 1-3 cm. long, elliptical to ovate or obovate —9.

- 9a. Leaves rounded at the apex **St. John's-wort, *Hypericum ellipticum*.**
- 9b. Leaves acute at the apex **St. John's-wort, *Hypericum virgatum*.**
- 10a. Leaves minute and scale-like, appressed to the stem, 1-3 mm. long (1-3 dm. high) **Pineweed, *Hypericum gentianoides*.**
- 10b. Leaves larger than 3 mm. —11.
- 11a. Bracts just below the base of the flower narrowly linear or thread-like —12.
- 11b. Bracts below each flower flat and leaf-like, oblong to ovate (1-3 dm. high; leaves elliptical) **St. John's-wort, *Hypericum boreale*.**
- 12a. Leaves oblong to ovate, rounded and clasping at the base (3-8 dm. high) —13.
- 12b. Leaves lanceolate, linear, or oblanceolate, not clasping at base —14.
- 13a. Leaves triangular-ovate, definitely heart-shaped at base **St. John's-wort, *Hypericum gymnanthum*.**
- 13b. Leaves oblong-ovate, barely heart-shaped at base **St. John's-wort, *Hypericum mutilum*.**
- 14a. Leaves lanceolate, broadest near the obtuse base (1-6 dm. high) **St. John's-wort, *Hypericum majus*.**
- 14b. Leaves linear or oblanceolate, tapering from near the middle to the base **St. John's-wort, *Hypericum canadense*.**

ELATINACEAE, the Waterwort Family

Small marsh herbs, with opposite leaves without translucent dots, and minute axillary flowers; sepals, petals, and stamens each 2.

1. Stems 2-5 cm. long; flowers in summer
Waterwort, *Elatine americana*.

CISTACEAE, the Rock-rose Family

Small herbs or shrubs, with opposite or alternate entire leaves; flowers regular, with 5 sepals, 3 or 5 petals, and 3 to many stamens.

- 1a. Flowers yellow; petals 5 (late spring, early summer) —2.
1b. Flowers greenish or purplish, minute, in panicles; petals 3 (2-6 dm. high; summer) (Pinweed. The Pinweeds are a difficult group to name. Much depends on the shape of the leaves on the basal shoots, which appear late in the season and usually

- 2a. Petals yellow Violet, *Viola rotundifolia*.
 2b. Petals white, blue, or violet —3.
 3a. Principal leaves at flowering-time deeply lobed (flowers violet)
 —4.
 3b. Principal leaves at flowering-time scarcely heart-shaped or
 kidney-shaped, mostly ovate to oblong or triangular, usually
 sharply toothed or irregularly incised near the base, more
 finely toothed or nearly entire above the base (flowers violet)
 —8.
 3c. Principal leaves at flowering time lanceolate or ovate, uniformly
 toothed, not heart-shaped at base; petals white, the three
 lower marked with violet lines —11.
 3d. Principal leaves broadly heart-shaped or kidney-shaped, neither
 lobed nor incised (flowers white or violet) —12.
 4a. Lateral petals with a patch of hairs near their base —5.
 4b. Lateral petals not bearded Violet, *Viola pedata*.
 5a. Plants more or less softly hairy, especially on the petioles —6.
 5b. Plants smooth or nearly so —7.
 6a. Most of the leaves 5-9-lobed Violet, *Viola palmata*.
 6b. Some or all of the leaves only 3-5-lobed
 Violet, *Viola triloba*.
 7a. Leaf-lobes linear or nearly so Violet, *Viola Brittoniana*.
 7b. Leaf-lobes oblong or oblong-ovate Violet, *Viola Stoneana*.
 8a. Leaves oblong or lanceolate in general outline —9.
 8b. Leaves ovate or triangular in general outline —10.
 9a. Flower-stalks averaging longer than the softly hairy, short-
 petioled leaves Violet, *Viola fimbriatula*.
 9b. Flower-stalks averaging as long as or shorter than the leaves,
 which are smooth or nearly so Violet, *Viola sagittata*.
 10a. Leaves sharply toothed only below the middle
 Violet, *Viola emarginata*.
 10b. Leaves sharply toothed throughout, but more deeply below
 Violet, *Viola pectinata*.
 11a. Leaves narrowly lanceolate Violet, *Viola lanceolata*.
 11b. Leaves ovate Violet, *Viola primulifolia*.
 12a. Flowers from a short, thick, more or less erect rootstock;
 flowers normally blue (common blue violets; reference to a
 Manual is recommended) —13.

- 12b. Foliage from an elongated slender rootstock; flowers white, the lower petals marked with blue —18.
- 13a. Plants more or less hairy —14.
- 13b. Plants smooth or nearly so —16.
- 14a. Petioles and lower side of the ascending leaves more or less hairy —15.
- 14b. Hairiness only on the upper surface of the small leaves, which generally lie flat on the ground; spurred petal hairy
Violet, *Viola hirsutula*.
- 15a. Spurred petal hairy
Violet, *Viola septentrionalis*.
- 15b. Spurred petal smooth
Violet, *Viola sororia*.
- 16a. Hairs on the lateral petals tipped with knobs
Violet, *Viola cucullata*.
- 16b. Hairs on the lateral petals not knobbed —17.
- 17a. Leaves even at flowering-time usually more than 5 cm. wide
Violet, *Viola papilionacea*.
- 17b. Leaves at flowering-time seldom more than 3 cm. wide
Violet, *Viola affinis*.
- 18a. Leaf-blades strictly without hairs
Violet, *Viola pallens*.
- 18b. Leaf-blades with some minute white hairs on the upper surface near the base
Violet, *Viola blanda*.
- 19a. Flowers distinctly yellow, the petals veined with purple —20.
- 19b. Flowers blue to cream-color or white, never distinctly yellow except at the base —21.
- 20a. Foliage softly hairy
Violet, *Viola pubescens*.
- 20b. Foliage nearly or quite smooth
Violet, *Viola scabriuscula*.
- 21a. Stipules large and leaf-like, deeply pinnatifid, and nearly or quite as long as the petiole
Violet, *Viola Rafinesqui*.
- 21b. Stipules small and inconspicuous, entire or toothed, and much shorter than the petiole —22.
- 22a. Stipules entire
Violet, *Viola canadensis*.
- 22b. Stipules toothed —23.
- 23a. Lateral petals bearded —24.
- 23b. Lateral petals not bearded
Violet, *Viola rostrata*.
- 24a. Flowers white or nearly white
Violet, *Viola striata*.
- 24b. Flowers blue
Violet, *Viola conspersa*.

CACTACEAE, the Cactus Family

Fleshy, jointed, leafless plants, armed with numerous spines; flowers large (5-8 cm. wide), yellow, with about 8 petals and numerous stamens.

1. Joints of the stem 6-10 cm. long (summer)

Prickly Pear, *Opuntia vulgaris*.

THYMELAEACEAE, the Mezereum Family

Shrubs, with simple, alternate, entire leaves, and small yellowish flowers in clusters, opening before the leaves; petals none, the sepals somewhat petal-like; stamens 8.

1. Leaves obovate (5-15 dm. high; twigs very tough; early spring)

Leatherwood, *Dirca palustris*.

LYTHRACEAE, the Loosestrife Family

Herbs or shrubs, with simple, opposite or alternate leaves; receptacle cup-shaped or tubular, bearing the 4-7 petals and sepals at its margin and the 4-12 stamens on its inner surface; ovary superior (summer).

- 1a. Flowers small, not more than 4 mm. wide, sessile or nearly so in the axils of the leaves (in swamps and marshes) —2.

- 1b. Flowers conspicuous, 6-25 mm. wide —4.

- 2a. All or most of the leaves alternate, linear (2-6 dm. high)

Loosestrife, *Lythrum Hyssopifolia*.

- 2b. All or most of the leaves opposite, oblong —3.

- 3a. Petals 5-7, about 3 mm. long (6-12 dm. high)

Loosestrife, *Lythrum lineare*.

- 3b. Petals 4, minute (1-2 dm. high) *Rotala*, *Rotala ramosior*.

- 4a. Stems very viscid; leaves ovate-lanceolate, long-petioled; plant of dry soil (2-6 dm. high; flowers purple, 6-8 mm. wide)

Cuphea, *Cuphea petiolata*.

- 4b. Stems smooth or nearly so; leaves narrow, short-petioled or sessile; plants of wet meadows or swamps —5.

- 5a. Leaves narrowed to the base (stems 1-2 m. long; flowers pale purple, 10 mm. wide, in axillary clusters)

Swamp Loosestrife, *Decodon verticillatus*.

- 5b. Leaves with a heart-shaped clasping base (7-12 dm. high; flowers purple, 15 mm. wide, in a terminal spike)

Loosestrife, *Lythrum Salicaria*.

MELASTOMACEAE, the Melastome Family

Herbs with opposite leaves with 3-5 principal longitudinal veins; receptacle urn-shaped, bearing 4 petals and 4 sepals at its margin; stamens 8; ovary 4-celled, superior (3-6 dm. high; flowers purple, 2-4 cm. wide, summer) (Meadow Beauty).

- 1a. Principal leaves ovate-lanceolate, more than 1 cm. wide

Meadow Beauty, *Rhexia virginica*.

- 1b. Principal leaves narrowly oblong to nearly linear, less than 1 cm. wide —2.

- 2a. Stems hairy, cylindrical

Meadow Beauty, *Rhexia mariana*.

- 2b. Stems smooth, square

Meadow Beauty, *Rhexia aristosa*.

ONAGRACEAE, the Evening Primrose Family

Herbs with opposite or alternate simple leaves and regular flowers; sepals and petals each 4 (or 2 in one genus); stamens 8 (2 in one genus), attached to the summit or inside of a tubular receptacle; ovary 2-4-celled, inferior (summer).

- 1a. Flowers minute, greenish, sessile, axillary; petals frequently none, leaves narrow, lanceolate to oblanceolate —2.

- 1b. Flowers showy, bright pink-purple, about 2 cm. wide, in a terminal raceme (7-20 dm. high; leaves lanceolate)

Fireweed, *Epilobium angustifolium*.

- 1c. Flowers small, 4-6 mm. wide, white or pink, with 4 petals notched at the end; leaves lanceolate to linear (Willow Herb) —4.

- 1d. Flowers in a terminal raceme, small, 2-3 mm. wide, white, with 2 petals deeply notched at the end; leaves all opposite, ovate (Enchanters' Nightshade) —7.

- 1e. Flowers yellow, with 4 petals —8.

- 2a. Stems prostrate (1-4 dm. long); leaves opposite, petioled

Water Purslane, *Ludvigia palustris*.

- 2b. Stems erect (6-10 dm. high); leaves alternate, sessile or nearly so —3.

- 3a. Capsule about as long as thick, and about as long as the sepals which persist upon it

Ludvigia, *Ludvigia sphaerocarpa*.

- 3b. Capsule much longer than thick, and much longer than the sepals

Ludvigia, *Ludvigia linearis*.

- 4a. Leaves entire, the margins usually somewhat revolute (3-6 dm. high) —5.
- 4b. Leaves toothed, always flat (4-9 dm. high) —6.
- 5a. Plant densely covered with spreading hairs
Willow Herb, *Epilobium molle*.
- 5b. Plant with appressed or incurved hairs
Willow Herb, *Epilobium densum*.
- 6a. Seeds tipped with a tuft of reddish brown hairs
Willow Herb, *Epilobium coloratum*.
- 6b. Seeds tipped with a tuft of white hairs
Willow Herb, *Epilobium adenocaulon*.
- 7a. Leaves rounded at the base, finely toothed (3-8 dm. high)
Enchanters' Nightshade, *Circaea lutetiana*.
- 7b. Leaves heart-shaped at the base, coarsely toothed (1-2 dm. high)
Enchanters' Nightshade, *Circaea alpina*.
- 8a. Sepals attached at the very summit of the ovary (3-10 dm. high; leaves lanceolate or linear; flowers axillary) —9.
- 8b. Sepals attached at the summit of the slender tubular receptacle, which is prolonged much beyond the summit of the ovary —11.
- 9a. Flowers conspicuous, 1-2 cm. wide (Seedbox) —10.
- 9b. Flowers very small, 5 mm. wide or less —3b.
- 10a. Stems smooth
Seedbox, *Ludvigia alternifolia*.
- 10b. Stems hairy
Seedbox, *Ludvigia hirtella*.
- 11a. Stamens all equal in length; flowers 2-4 cm. wide (Evening Primrose) —12.
- 11b. The alternate stamens longer (Sundrops) —14.
- 12a. All or most of the leaves deeply toothed or pinnatifid (stems frequently decumbent, 2-5 dm. long)
Evening Primrose, *Oenothera laciniata*.
- 12b. Leaves entire or remotely and shallowly toothed (5-12 dm. high) —13.
- 13a. Hairs on the stem appressed
Evening Primrose, *Oenothera Oakesiana*.
- 13b. Hairs on the stem spreading, with broadened reddish bases
Evening Primrose, *Oenothera muricata*.
- 13c. Hairs on the stem spreading, not enlarged at base
Evening Primrose, *Oenothera biennis*.

- 14a. Stalk of the capsule at least half as long as the capsule itself —15.
- 14b. Stalk of the capsule none, or less than half as long as the capsule —16.
- 15a. Capsule with short spreading hairs
Sundrops, *Oenothera longipedicellata*.
- 15b. Capsule with short incurved hairs Sundrops, *Oenothera linearis*.
- 16a. Capsule smooth or with gland-tipped hairs —17.
- 16b. Capsule beset with simple hairs
Sundrops, *Oenothera pratensis*.
- 17a. Petals 5–10 mm. long Sundrops, *Oenothera pumila*.
- 17b. Petals 15–25 mm. long Sundrops, *Oenothera fruticosa*.

HALORAGIDACEAE, the Water Milfoil Family

Aquatic or marsh herbs, with alternate, opposite, or whorled leaves, and small, inconspicuous, terminal or axillary flowers, frequently without petals (summer).

- 1a. Flowering stem leafless or with a few thread-like leaves (stems 1–3 dm. long) Water Milfoil, *Myriophyllum tenellum*.
- 1b. Flowering stems leafy —2.
- 2a. Sepals 3; the leaves which subtend the flowers 2–3 cm. long (1–5 dm. high, or prostrate) (Mermaid Weed) —3.
- 2b. Sepals 4; the leaves subtending the flowers rarely more than 1 cm. long (stems floating, or rooting on muddy shores) (Water Milfoil) —4.
- 3a. Leaves subtending the flowers merely toothed
Mermaid Weed, *Proserpinaca palustris*.
- 3b. Leaves subtending the flowers pinnately divided to the midrib
Mermaid Weed, *Proserpinaca pectinata*.
- 4a. Fruits smooth; leaves mostly opposite or alternate
Water Milfoil, *Myriophyllum humile*.
- 4b. Fruits with 2 prominent ridges on the back; leaves mostly whorled
Water Milfoil, *Myriophyllum scabratum*.

ARALIACEAE, the Sarsaparilla Family

Herbs or thorny shrubs, with alternate or whorled leaves and small flowers in umbels; sepals 5, minute; petals and stamens each 5; ovary inferior, with 2–5 styles, ripening into a berry.

- 1a. Leaves once-compound, whorled; umbel 1 (1-2 dm. high; flowers white, spring) **Dwarf Ginseng, *Panax trifolium*.**
- 1b. Leaves 2-3 times compound; umbels several —2.
- 2a. Stems and petioles spiny or bristly (flowers white, summer) —3.
- 2b. Stems and petioles smooth or slightly hairy (flowers greenish white) —4.
- 3a. Shrubby, with stout thorns (1-3 m. high)
Hercules' Club, *Aralia spinosa*.
- 3b. Herbaceous, with slender bristles (4-10 dm. high)
Bristly Sarsaparilla, *Aralia hispida*.
- 4a. Stem-leaves present; leaflets heart-shaped at the base (8-15 dm. high; summer) **Spikenard, *Aralia racemosa*.**
- 4b. Leaf and flower-stalk both arising from the ground; leaflets acute at the base (2-4 dm. high; late spring)
Wild Sarsaparilla, *Aralia nudicaulis*.

UMBELLIFERAE, the Parsley Family

Herbs, with alternate, usually compound leaves, the petioles dilated at the base; flowers small, in umbels, compound umbels, or heads; sepals 5, minute or even wanting; petals and stamens each 5; ovary inferior, with 2 styles, ripening into a dry fruit.

- 1a. Leaves simple (summer) —2.
- 1b. Leaves, or some of them, compound or deeply cleft —5.
- 2a. Leaves hollow, club-shaped, transversely divided within (creeping in mud, 1 dm. high; flowers white)
Lilaeopsis, *Lilaeopsis lineata*.
- 2b. Leaves flat, ovate, perfoliate (3-6 dm. high; flowers yellow)
Thoroughwax, *Bupleurum rotundifolium*.
- 2c. Leaves flat, kidney-shaped or almost circular (stems creeping) (Marsh Pennywort) —3.
- 2d. Leaves flat, linear, spiny-toothed (3-10 dm. high; flowers in dense heads, blue or white) (Button Snakeroot) —4.
- 3a. Leaves peltate, attached by the center
Marsh Pennywort, *Hydrocotyle umbellata*.
- 3b. Leaves attached by the margin
Marsh Pennywort, *Hydrocotyle americana*.
- 4a. Leaves parallel-veined
Button Snakeroot, *Eryngium yuccifolium*.

- 4b. Leaves net-veined **Button Snakeroot**, *Eryngium aquaticum*.
- 5a. Flowers yellow or purple —6.
- 5b. Flowers white or greenish —10.
- 6a. Leaf-segments entire (4-8 dm. high; late spring)
Golden Alexander, *Taenidia integerrima*.
- 6b. Leaf-segments toothed or incised —7.
- 7a. Leaves pinnately compound; some of the leaflets incised or pinnatifid (6-15 dm. high; summer)
Wild Parsnip, *Pastinaca sativa*.
- 7b. Leaves ternately compound, the segments crenate or serrate —8.
- 7c. Leaves deeply palmately cleft or divided; flowers in head-like umbels —14a.
- 8a. Terminal leaflet conspicuously stalked, its total length, including the stalk, at least 50% greater than the length of the lateral leaflets (3-6 dm. high; early summer)
Meadow Parsnip, *Thaspium aureum*.
- 8b. Terminal leaflet not conspicuously stalked, its total length, including the stalk, about equaling that of the lateral leaflets (4-8 dm. high; late spring) (**Golden Alexander**) —9.
- 9a. Basal and lower stem-leaves 2-3-ternately compound
Golden Alexander, *Zizia aurea*.
- 9b. Basal leaves simple and heart-shaped; stem-leaves once-ternate
Golden Alexander, *Zizia cordata*.
- 10a. Leaves once-pinnate (or the submerged leaves decompose, if present) (summer) —11.
- 10b. Leaves ternately, palmately, or 2-3-pinnately compound —13.
- 11a. Leaf-segments thread-like (3-6 dm. high)
Mock Bishop-weed, *Ptilimnium capillaceum*.
- 11b. Leaf-segments narrowly oblong to nearly linear (6-15 dm. high) —12.
- 12a. Leaflets entire, or with a few low remote teeth
Cowbane, *Oxypolis rigidior*.
- 12b. Leaflets finely but sharply toothed
Water Parsnip, *Sium circutaefolium*.
- 13a. Leaves palmately or ternately once-compound —14.
- 13b. Leaves 2-3 times compound or decompose —19.
- 14a. Flowers short-pedicelled, crowded in head-like umbels, greenish; ovary bristly (4-9 dm. high; early summer) (**Black Snakeroot**) —15.

- 14b. Flowers in open umbels, white —18.
- 15a. Styles short, not projecting beyond the bristles of the mature fruit —16.
- 15b. Styles long, projecting beyond the bristles of the fruit, and recurved —17.
- 16a. Staminate flowers on pedicels 3-4 mm. long
Black Snakeroot, *Sanicula trifoliata*.
- 16b. Staminate flowers short-pedicelled, concealed among the pistillate ones
Black Snakeroot, *Sanicula canadensis*.
- 17a. Fruit short-stalked, 4 mm. long or less
Black Snakeroot, *Sanicula gregaria*.
- 17b. Fruit sessile, 6-7 mm. long
Black Snakeroot, *Sanicula marilandica*.
- 18a. Umbel unsymmetrical, its branches irregular in length; stems smooth (3-8 dm. high; early summer)
Honewort, *Cryptotaenia canadensis*.
- 18b. Umbel symmetrical with regular branches; stems hairy (10-25 dm. high; summer) Cow Parsnip, *Heracleum lanatum*.
- 19a. Ovary and fruit bristly (4-10 dm. high) —20.
- 19b. Ovary and fruit smooth or winged, never bristly (summer) —23.
- 20a. Umbels loose, open, few-flowered; woodland plants blooming in spring (4-9 dm. high) (Sweet Cicely) —21.
- 20b. Umbels regular, many-flowered; weedy plants blooming in summer (4-9 dm. high) —22.
- 21a. Stem softly hairy Sweet Cicely, *Osmorhiza Claytoshi*.
- 21b. Stem smooth, except at the joints
Sweet Cicely, *Osmorhiza longistylis*.
- 22a. Principal branches of the umbel 3-8
Hedge Parsley, *Torilis Anthriscus*.
- 22b. Principal branches of the umbel 12 or more
Wild Carrot, *Daucus Carota*.
- 23a. Leaf-segments linear —24.
- 23b. Leaf-segments lanceolate or broader —25.
- 24a. Leaf-segments entire (3-6 dm. high)
Mock Bishop-weed, *Ptilimnium capillaceum*.
- 24b. Leaf-segments toothed (4-10 dm. high)
Water Hemlock, *Cicuta bulbifera*.

- 25a. Leaf-segments coarsely incised, so that the leaf appears dissected
(swamp plants 5-15 dm. high)

Hemlock Parsley, *Conioselinum chinense*.

- 25b. Leaf-segments merely toothed —26.

- 26a. Leaf twice ternately compound, bearing 9 mostly obovate
leaflets, which are coarsely toothed above the middle (4-8 dm.
high)

Sea Parsley, *Ligusticum scoticum*.

- 26b. Leaf bearing more than 9 leaflets (8-15 dm. high) —27.

- 27a. Umbel densely hairy

Angelica, *Angelica villosa*.

- 27b. Umbel smooth —28.

- 28a. Leaf-segments broadly ovate

Angelica, *Angelica atropurpurea*.

- 28b. Leaf-segments lanceolate

Water Hemlock, *Cicuta maculata*.

CORNACEAE, the Dogwood Family

Trees or shrubs, with alternate or opposite, entire leaves and small flowers in rather crowded, flattened or rounded clusters; sepals 4, minute; petals and stamens each 4; ovary inferior, ripening into a berry. In the genus *Nyssa* the flowers are minute and greenish, with 5 sepals and petals minute or none.

- 1a. Leaves alternate, ovate to ovate-oblong —2.

- 1b. Leaves opposite —3.

- 2a. Flowers white, conspicuous, in flattened terminal clusters
(shrub 2-4 m. high; late spring)

Dogwood, *Cornus alternifolia*.

- 2b. Flowers greenish, inconspicuous, in small axillary clusters
(tree; spring)

Sour Gum, *Nyssa sylvatica*.

- 3a. Flower-clusters small and dense, surrounded by a showy involucre
of 4 white bracts, each 3-5 cm. long, resembling a corolla of
4 petals (tall shrub or tree; individual flowers greenish yellow)

Flowering Dogwood, *Cornus florida*.

- 3b. Flowers in open flattened clusters, without petal-like involucre;
petals white (shrubs 1-4 m. high; leaves broadly ovate to
ovate-lanceolate; late spring) (Dogwood) —4.

- 4a. Leaves distinctly hairy beneath with woolly or spreading hairs
—5.

- 4b. Leaves smooth beneath, or with short appressed hairs —6.

- 5a. Leaves at least twice as long as wide; branches purplish

Dogwood, *Cornus Amomum*.

- 9a. Leaves acute; pedicels with a pair of bractlets near the middle
Cranberry, *Vaccinium Oxycoccus*.
- 9b. Leaves obtuse; pedicels with a pair of leaf-like bractlets near the top
Cranberry, *Vaccinium macrocarpon*.
- 10a. Principal leaves about 5 mm. long (Pine Barren shrub 2-10 dm. high; flowers white, 5 mm. wide, spring)
Sand Myrtle, *Leiophyllum buxifolium*.
- 10b. Principal leaves much larger (summer) —11.
- 11a. Erect shrub 1-3 m. tall; leaves obovate; flowers white, small, in long racemes
Sweet Pepperbush, *Clethra alnifolia*.
- 11b. Herbaceous or nearly so, 1-3 dm. high; flowers pink, in a small cluster —12.
- 12a. Leaves broadest above the middle, green
Prince's Pine, *Chimaphila umbellata*.
- 12b. Leaves broadest below the middle, spotted with white
Spotted Wintergreen, *Chimaphila maculata*.
- 13a. Stems prostrate or trailing —14.
- 13b. Stems erect or spreading, often freely branched —16.
- 14a. Flowers 10-15 mm. long, pink or rarely white, fragrant (leaves round or oval, often heart-shaped at base, hairy beneath; early spring)
Trailing Arbutus, *Epigaea repens*.
- 14b. Flowers about 5 mm. long, white (late spring) —15.
- 15a. Leaves oval, 1 cm. long or less, hairy beneath; lobes of the corolla 4
Snowberry, *Chiogenes hispida*.
- 15b. Leaves spatulate or obovate, mostly 2-3 cm. long, smooth; lobes of the corolla usually 5
Bearberry, *Arctostaphylos Uva-ursi*.
- 16a. Flowers purple or crimson, the rotate or saucer-shaped corolla 6-20 mm. wide; leaves opposite or whorled, narrowly oblong (5-10 dm. high; summer) —17.
- 16b. Flowers pink to white, 2-5 cm. wide (leaves mostly alternate) —18.
- 16c. Flowers pink to white or red, never rotate, and less than 1 cm. wide —22.
- 17a. Branches and twigs with 2 sharp angles (leaves revolute; flowers mostly about 15 mm. wide) **Swamp Laurel, *Kalmia polifolia*.**
- 17b. Branches and twigs cylindrical, not angled (flowers usually about 8 mm. wide) **Sheep Laurel, *Kalmia angustifolia*.**

- 18a. Corolla rotate or saucer-shaped, shallowly lobed (2-6 m. high; leaves narrowly elliptical; spring)
Mountain Laurel, *Kalmia latifolia*.
- 18b. Corolla funnel-form, deeply lobed —19.
- 19a. Leaves thick and evergreen, oblong (2-5 m. high; early summer)
Rhododendron, *Rhododendron maximum*.
- 19b. Leaves thin, deciduous, at flowering-time more or less clustered toward the end of the branches —20.
- 20a. Corolla quite irregular, its upper lip shallowly 3-lobed, the lower lip deeply 2-divided (4-8 dm. high; leaves oblong; spring)
Rhodora, *Rhododendron canadense*.
- 20b. Corolla nearly regular, its 5 lobes of about equal length (5-20 dm. high; leaves oblong or obovate-oblong) —21.
- 21a. Flowers in early spring, appearing with the leaves
Wild Honeysuckle, *Rhododendron nudiflorum*.
- 21b. Flowers in early summer, after the leaves have expanded
Swamp Honeysuckle, *Rhododendron viscosum*.
- 22a. Low shrubs 10-15 cm. high, erect from a creeping rootstock, simple or sparingly branched; leaves few, rounded or ovate, with the taste of wintergreen (flowers white, axillary, nodding, about 5 mm. long, summer)
Wintergreen, *Gaultheria procumbens*.
- 22b. Swamp shrubs 5-10 dm. high; leaves oblong, scurfy beneath with rusty scales (flowers white, 5 mm. long, in terminal leafy racemes, spring) **Leather-leaf, *Chamaedaphne calyculata*.**
- 22c. Shrubs 3-12 dm. high; leaves oblong to obovate-oblong, dotted beneath with shining yellowish resinous dots (flowers white, 3-8 mm. long, in short racemes, spring) —23.
- 22d. Shrubs 2 dm. to 4 m. high; leaves not resinous or scurfy beneath (spring) —25.
- 23a. Leaves pale and whitened beneath (6-12 dm. high)
Tangleberry, *Gaylussacia frondosa*.
- 23b. Leaves green on both sides (3-8 dm. high) (**Huckleberry**) —24.
- 24a. Leaves obtuse or acute **Huckleberry, *Gaylussacia baccata*.**
- 24b. Leaves mucronate at the apex
Huckleberry, *Gaylussacia dumosa*.
- 25a. Flowers nearly cylindrical, white, 6-8 mm. long, in dense one-sided racemes 5-10 cm. long (1-4 m. high; leaves oblong to ovate-lanceolate; spring) **Fetterbush, *Lencothoe racemosa*.**

25b. Flowers open-bell-shaped, purplish green or yellowish green, about 8 mm. wide, with protruding stamens, on slender pedicels in loose, very leafy racemes (5-15 dm. high; leaves oblong; spring) **Deerberry, *Vaccinium stamineum*.**

25c. Flowers nearly globular, white, about 3 mm. in diameter, in terminal panicles (1-4 dm. high; leaves obovate; spring)

Male Berry, *Lyonia ligustrina*.

25d. Flowers ovoid-cylindrical, 10-12 mm. long, white or pink, in sessile umbels along the side of nearly naked twigs (4-12 dm. high; leaves oblong or oval; spring)

Stagger-bush, *Lyonia mariana*.

25e. Flowers in short terminal or lateral racemes or few-flowered clusters, the corollas ovoid to short-cylindrical —26.

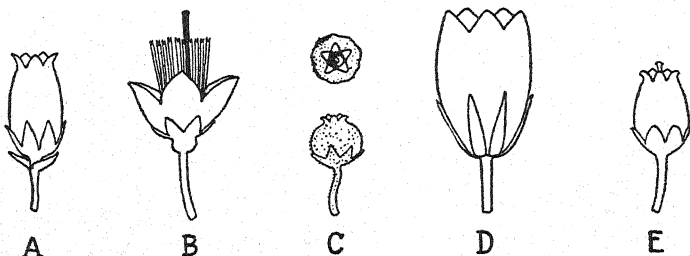


FIG. 23. Flowers of Ericaceae, to illustrate paragraph 25, all twice natural size. A. *Leucothoe racemosa*; B. *Vaccinium stamineum*; C. *Lyonia ligustrina*; D. *Lyonia mariana*; E. *Vaccinium atrococcum*.

26a. Leaves linear, whitened beneath, their margins strongly revolute (4-10 dm. high; flowers white, about 6 mm. long, spring) **Bog Rosemary, *Andromeda glaucophylla*.**

26b. Leaves oblong-lanceolate to ovate, not revolute (spring) (Blueberry) —27.

27a. Low bushy shrubs usually less than 5 dm. and never more than 1 m. in height (flowers white, 4-6 mm. long) —28.

27b. Tall erect shrubs 1-4 m. high (flowers 6-10 mm. long) —30.

28a. Foliage hairy

Blueberry, *Vaccinium canadense*.

28b. Foliage smooth —29.

29a. Leaves pale green and glaucous, entire or nearly so

Blueberry, *Vaccinium vacillans*.

29b. Leaves bright green, distinctly but finely toothed

Blueberry, *Vaccinium pennsylvanicum*.

30a. Corolla rose-color, about cylindrical

Blueberry, *Vaccinium virgatum*.

30b. Corolla white, or tinged with green or pink —31.

31a. Leaves downy beneath, not yet expanded at flowering-time

Blueberry, *Vaccinium atrococcum*.

31b. Leaves smooth or nearly so beneath, about half-grown at flowering-time

Blueberry, *Vaccinium corymbosum*.

DIAPENSIACEAE, the Diapensia Family

Small woody evergreen, with narrow, sharp-pointed leaves; sepals 5; petals 5, united; stamens 5, attached to the corolla; ovary 3-celled.

1. Growing in mats in Pine Barrens, the stems 1-3 dm. long; flowers numerous, white or pink, 5 mm. wide, spring

Pyxie, *Pyxidantha barbulata*.

PLUMBAGINACEAE, the Leadwort Family

Herbs with basal leaves and regular flowers in panicles; sepals 5; petals 5, nearly separate, each with a stamen attached to its base; ovary 1-celled.

1. Leaves oblanceolate (2-6 dm. high; flowers lavender, about 3 mm. wide, late summer) Sea Lavender, *Limonium carolinianum*.

PRIMULACEAE, the Primrose Family

Herbs, with alternate, opposite, or basal simple leaves and regular flowers; petals more or less united, or none in one genus; stamens attached one in front of each petal; ovary 1-celled with one style.

1a. Aquatic; leaves basal, dissected into narrow divisions; stems inflated, hollow (1-2 dm. high; flowers white, about 5 mm. wide, in circles on the stem, summer)

Featherfoil, *Hottonia inflata*.

1b. Leaves cauline, alternate, obovate to elliptical, entire (1-4 dm. high; flowers minute, white, summer)

Water Pimpernel, *Samolus floribundus*.

1c. Leaves cauline, opposite or whorled, entire or barely toothed —2.

2a. Corolla none (1-2 dm. high; leaves narrowly oblong, 5-10 mm. long; seashores; summer)

Sea Milkwort, *Glaux maritima* var. *obtusifolia*.

- 2b. Corolla white to blue or red, never yellow —3.
 2c. Corolla yellow (summer) —4.
 3a. Leaves in a single whorl of 5-10, lanceolate (1-3 dm. high; flowers pink to white, 1 cm. wide, with usually 7 petals, summer) **Star Flower, *Trientalis americana*.**
 3b. Leaves opposite, ovate or oval (diffusely spreading, 1-3 dm. high; flowers usually scarlet, 5 mm. wide, 5-lobed, spring and summer) **Pimpernel, *Anagallis arvensis*.**
 4a. Flowers 5 mm. wide, in dense axillary racemes (3-8 dm. high; leaves lanceolate) **Loosestrife, *Lysimachia thyrsiflora*.**
 4b. Flowers 8-10 mm. wide, in terminal racemes (3-9 dm. high; leaves lanceolate or ovate-lanceolate) (Loosestrife) —5.
 4c. Flowers axillary —6.
 5a. Flowers all in racemes; leaves opposite or some of them alternate **Loosestrife, *Lysimachia terrestris*.**
 5b. Lowest flowers axillary; leaves opposite or whorled **Loosestrife, *Lysimachia producta*.**
 6a. Stems creeping; leaves broadly oval to circular (flowers about 2 cm. wide) **Moneywort, *Lysimachia Nummularia*.**
 6b. Stems erect; leaves ovate to lanceolate (3-9 dm. high) (Loosestrife) —7.
 7a. Corolla dotted and streaked with purple-brown, about 10 mm. wide; leaves usually whorled **Loosestrife, *Lysimachia quadrifolia*.**
 7b. Corolla plain yellow, 10-20 mm. wide; leaves all opposite —8.
 8a. Leaves narrowly ovate, on slender ciliate petioles **Loosestrife, *Steironema ciliatum*.**
 8b. Leaves lanceolate, sessile or short-petioled **Loosestrife, *Steironema lanceolatum*.**

EBENACEAE, the Ebony Family

Trees with alternate entire leaves; sepals 4; petals 4, united; stamens 8 or 16, attached to the corolla-tube; style 4; fruit an edible plum-like berry.

1. Leaves ovate-oblong; flowers pale yellow, early summer
Persimmon, *Diospyros virginiana*.

OLEACEAE, the Olive Family

Trees or shrubs, with opposite compound leaves and inconspicuous

regular flowers; sepals 4 or none; petals none; stamens 2; fruit tipped with a flat wing (flowers yellowish, spring) (Ash).

1a. Lateral leaflets sessile Black Ash, *Fraxinus nigra*.

1b. Lateral leaflets on short stalks —2.

2a. Twigs smooth White Ash, *Fraxinus americana*.

2b. Twigs velvety-hairy Red Ash, *Fraxinus pennsylvanica*.

GENTIANACEAE, the Gentian Family

Herbs, with opposite or basal, entire, usually simple leaves and regular flowers; sepals, petals, and stamens equal in number, 4-12; ovary superior, 1-celled.

1a. Leaves rounded, floating (flowers white, about 1 cm. wide, with 5 petals, summer) Floating Heart, *Nymphoides lacunosum*.

1b. Leaves compound, all basal or on a creeping rootstock (marsh plant; flower-stalks 1-3 dm. high; flowers white or bluish, funnellform, with 5 lobes, about 1 cm. long, early summer)

Buckbean, *Menyanthes trifoliata*.

1c. Leaves of the stem reduced to small scales (1-4 dm. high; corolla bell-shaped, with 4 lobes) —2.

1d. Leaves leaf-like, opposite, simple —4.

2a. Flowers in spring, dull purplish white (flowers about 1 cm. long) Pennywort, *Obolaria virginica*.

2b. Flowers in summer, yellowish or greenish white (flowers 8 mm. long or less) (Bartonia) —3.

3a. Corolla-lobes obtuse Bartonia, *Bartonia virginica*.

3b. Corolla-lobes acute Bartonia, *Bartonia paniculata*.

4a. Corolla pink to rose-purple (varying to white), rotate or widely spreading, deeply cleft into 5-12 nearly separate segments (3-8 dm. high; summer) (Marsh Pink) —5.

4b. Corolla violet-blue, salverform, about 5 cm. long, its lobes (usually 4) deeply fringed (3-6 dm. high; leaves lanceolate; fall) Fringed Gentian, *Gentiana crinita*.

4c. Corolla blue (varying to white), tubular or funnel-form, its lobes none or much shorter than the tube (2-6 dm. high; late summer and fall) (Gentian) —9.

5a. Petals 8-12; flowers 3-5 cm. wide (upper leaves narrowly lanceolate) Marsh Pink, *Sabatia dodecandra*.

5b. Petals 5; flowers 1.5-3.5 cm. wide —6.

6a. Branches opposite; leaves ovate to lanceolate —7.

6b. Branches alternate; leaves narrowly oblong to linear —8.

7a. Flowers pink with a green center

Marsh Pink, *Sabatia angularis*.

7b. Flowers white

Marsh Pink, *Sabatia lanceolata*.

8a. Style divided to its middle

Marsh Pink, *Sabatia gracilis*.

8b. Style divided almost to its base

Marsh Pink, *Sabatia stellaris*.

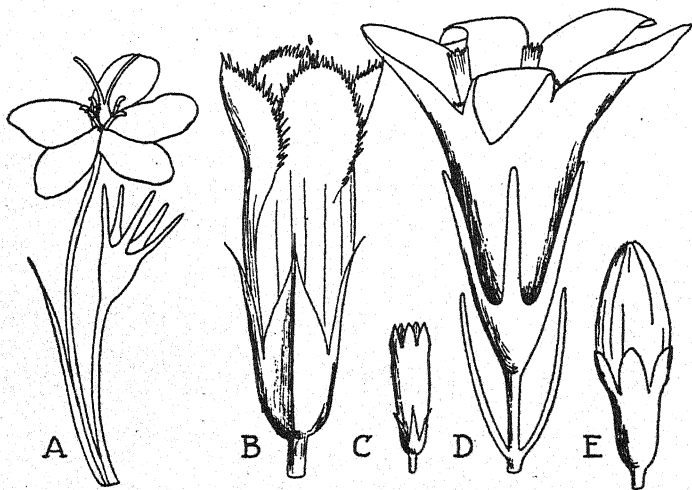


FIG. 24. Flowers of the Gentian Family, about natural size. A. *Sabatia stellaris* (4a, 8b); B. *Gentiana crinita* (4b); C. *Gentiana quinquefolia* (4c, 9a); D. *Gentiana Porphyrio* (4c, 9b); E. *Gentiana Andrewsii* (4c, 9c, 10b).

9a. Corolla 1-2 cm. long, its tube open at the top and the petals visible; leaves ovate-lanceolate

Gentian, *Gentiana quinquefolia*.

9b. Corolla 3-5 cm. long, funnel-form with spreading petals; leaves linear (Pine Barrens only) Gentian, *Gentiana Porphyrio*.

9c. Corolla 3-5 cm. long, its tube nearly or quite closed at the top

10a. Calyx-lobes equaling or exceeding the calyx-tube

Closed Gentian, *Gentiana Saponaria*.

10b. Calyx-lobes shorter than the calyx-tube

Closed Gentian, *Gentiana Andrewsii*.

APOCYNACEAE, the Dogbane Family

Herbs with opposite entire leaves and regular flowers; sepals and stamens each 5; petals united; stamens attached to the corolla; ovaries 2, with a single style and stigma.

1a. Plant creeping or trailing; flowers blue, axillary, 2-3 cm. broad (leaves oblong; spring) Periwinkle, *Vinca minor*.

1b. Plants erect or essentially so; flowers in clusters, 1 cm. broad or less (4-12 dm. high) —2.

2a. Corolla-lobes spreading or recurved (3-5 dm. high; leaves oval or elliptical; flowers pink or white, early summer) (Dogbane) —3.

2b. Corolla-lobes erect (5-12 dm. high; leaves oblong or ovate-oblong; flowers greenish white, summer) (Indian Hemp) —4.

3a. Corolla-lobes merely spreading Dogbane, *Apocynum medium*.

3b. Corolla-lobes recurved Dogbane, *Apocynum androsaemifolium*.

4a. Leaves petioled, acute at the base, smooth beneath

Indian Hemp, *Apocynum cannabinum*.

4b. Leaves petioled, acute at the base, hairy beneath

Indian Hemp, *Apocynum cannabinum* var. *pubescens*.

4c. Leaves sessile, rounded or truncate at the base

Indian Hemp, *Apocynum cannabinum* var. *hypericifolium*.

ASCLEPIADACEAE, the Milkweed Family

Herbs with simple entire leaves and regular flowers; juice usually milky. The flowers have an unusual structure; sepals 5; petals 5, united with each other and in most species spreading or reflexed so that they conceal the calyx; stamens 5, united with each other and with the stigma to form a complex organ in the center of the flower; on the back of each stamen is a colored projecting organ called a hood, which is frequently the most conspicuous part of the flower and may be mistaken for the corolla; ovaries 2 (summer).

1a. Twining vine (5-15 dm. high; leaves ovate-lanceolate; flowers dark purple, about 5 mm. wide)

Black Swallow-wort, *Cynanchum nigrum*.

- 1b. Stems not twining, erect or nearly so —2.
 2a. Leaves alternate, linear-oblong (3-6 dm. high; flowers brilliant orange) **Butterfly Weed, *Asclepias tuberosa*.**
 2b. Leaves whorled (3-6 dm. high) (Milkweed) —3.
 2c. Leaves opposite —4.
- 3a. Leaves lanceolate, in whorls of 4 (flowers pink) **Milkweed, *Asclepias quadrifolia*.**
 3b. Leaves linear, in whorls of 4-7 (flowers greenish white) **Milkweed, *Asclepias verticillata*.**
 4a. Umbels lateral, sessile (4-10 dm. high; leaves ovate-oblong; flowers green) **Green Milkweed, *Acerates viridiflora*.**
 4b. Umbels stalked (Milkweed) —5.
- 5a. Reflexed lobes of the corolla white (or purple only at the base) (leaves oblong) **Milkweed, *Asclepias variegata*.**
 5b. Reflexed lobes of the corolla greenish, greenish white, or somewhat tinged with purple —6.
 5c. Reflexed lobes of the corolla purple or red —8.
- 6a. Leaves downy beneath, oblong, obtuse at the base (1-2 m. high) **Milkweed, *Asclepias syriaca*.**
 6b. Leaves smooth beneath —7.
- 7a. Leaves heart-shaped at base, oblong, obtuse and mucronate at apex (5-10 dm. high) **Milkweed, *Asclepias amplexicaulis*.**
 7b. Leaves tapering to the base, ovate-lanceolate, acuminate at the apex (8-15 dm. high) **Milkweed, *Asclepias phytolaccoides*.**
 8a. Leaves smooth beneath —9.
 8b. Leaves hairy beneath (leaves ovate-lanceolate) —10.
- 9a. Hoods about 6 mm. long (4-10 dm. high; leaves ovate to ovate-lanceolate) **Milkweed, *Asclepias rubra*.**
 9b. Hoods 2-3 mm. long (5-15 dm. high; leaves lanceolate) **Milkweed, *Asclepias incarnata*.**
 10a. Hoods 2-3 mm. long (5-15 dm. high) **Milkweed, *Asclepias incarnata* var. *pulchra*.**
 10b. Hoods about 6 mm. long (6-12 dm. high) **Milkweed, *Asclepias purpurascens*.**

CONVOLVULACEAE, the Morning Glory Family

Twining or trailing herbs (except one species) with regular flowers; sepals 5; petals 5, united; stamens 5, attached to the corolla; ovary superior, 2-3-celled.

- 1a. Plants with green foliage and conspicuous flowers (summer) —2.
- 1b. Leafless, brown or yellow, twining, parasitic plants, with very small flowers (summer and fall) (Dodder) —6.
- 2a. Leaves heart-shaped, not lobed (flowers 5–8 cm. long) (Morning Glory) —3.
- 2b. Leaves oval, obtuse (stems erect, not climbing, 1–3 dm. high; flowers white, 5 cm. long)

Bindweed, *Convolvulus spithameus*.

- 2c. Leaves heart-shaped at base, but the blade deeply 3-lobed (flowers purple or light blue, 3–4 cm. long)

Morning Glory, *Ipomoea hederacea*.

- 2d. Leaves hastate or sagittate, with sharp or prominent basal lobes (Bindweed) —4.
- 2e. Leaves linear (stems spreading, 3–6 dm. long; flowers white, 2–3 cm. long; Pine Barrens) *Breweria*, *Breweria Pickeringii*.
- 3a. Stem smooth or nearly so (flowers white)

Morning Glory, *Ipomoea pandurata*.

- 3b. Stem with reflexed hairs (flowers blue to purple or white)

Morning Glory, *Ipomoea purpurea*.

- 4a. Calyx almost concealed by 2 large heart-shaped bracts (flowers white or pink, 5 cm. long) —5.
- 4b. Calyx without bracts (flowers white, 3 cm. long)

Bindweed, *Convolvulus arvensis*.

- 5a. Smooth, the leaves triangular Bindweed, *Convolvulus sepium*.
- 5b. Hairy, the leaves oblong

Bindweed, *Convolvulus sepium* var. *pubescens*.

- 6a. Flowers nearly or quite sessile —7.
- 6b. Flowers distinctly stalked, the common species

Dodder, *Cuscuta Gronovii*.

- 7a. Flowers in small clusters, the sepals united

Dodder, *Cuscuta arvensis*.

- 7b. Flowers in compact clusters, the sepals separate

Dodder, *Cuscuta compacta*.

POLEMONIACEAE, the Polemonium Family

Herbs with alternate, opposite, or clustered leaves and conspicuous regular flowers; sepals 5, united; petals 5, united into a salverform corolla; stamens 5, attached to the corolla-tube and not projecting; ovary superior, 3-celled; style 3-lobed.

- 1a. Leaves fascicled, narrowly linear (growing in mats, about 1 dm. high; flowers pink-purple, 2 cm. wide, spring)

Moss Pink, *Phlox subulata*.

- 1b. Leaves flat, strictly opposite; stems erect (flowers 2-3 cm. wide)
—2.

- 2a. Flowers in summer (8-15 dm. high; leaves oblong-lanceolate, smooth, flowers purple) Garden Phlox, *Phlox paniculata*.

- 2b. Flowers in spring (3-6 dm. high; leaves linear-lanceolate, hairy; flowers pink or red-purple)

Sweet William, *Phlox pilosa*.

HYDROPHYLLACEAE, the Waterleaf Family

Herbs with alternate lobed or divided leaves and regular flowers; sepals 5; petals 5, united into a bell-shaped corolla; stamens 5, attached to the corolla-tube and projecting beyond it; ovary 1-celled; style 2-lobed.

1. Stems 2-6 dm. high; flowers bluish purple, about 1 cm. long, spring
Water-leaf, *Hydrophyllum virginianum*.

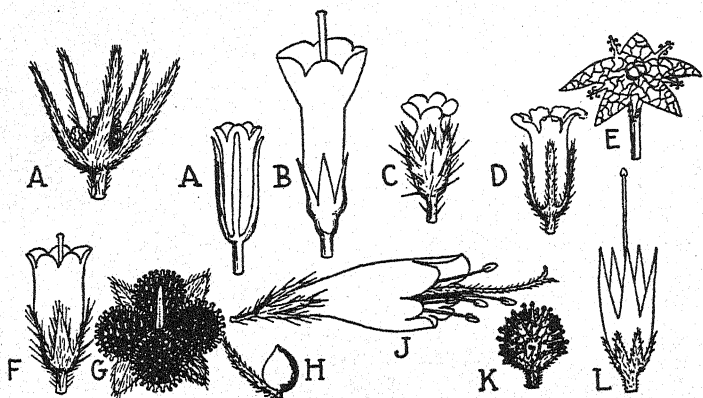


FIG. 25. Flowers and fruits of Boraginaceae. A. *Lithospermum arvense*, flower and fruit, $\times 2$; B. *Mertensia virginica*, natural size; C. *Myosotis virginica*, $\times 4$; D. *Heliotropium europaeum*, $\times 4$; E. *Asperugo procumbens*, fruit $\times 2$; F. *Symphytum officinale*, natural size; G. *Cynoglossum officinale*, fruit $\times 2$; H. *Lithospermum officinale*, fruit and one sepal, $\times 2$; J. *Echium vulgare*, natural size; K. *Cynoglossum virginianum*, part of fruit, $\times 2$; L. *Onosmodium virginianum*, $\times 2$.

BORAGINACEAE, the Borage Family

Herbs with alternate entire leaves and usually regular flowers, axillary or in racemes; sepals 5; petals 5, united; stamens 5, attached to the corolla-tube; ovary deeply 4-lobed with a single style.

1a. Flowers bright blue or purple, 15-25 mm. long or wide —2.

1b. Flowers either much smaller in size, or not blue in color —6.

2a. Stems perfectly smooth (3-6 dm. high; leaves obovate; corolla trumpet-shaped; spring)

Bluebell, *Mertensia virginica*.

2b. Stems hairy (4-10 dm. high; summer) —3.

3a. Corolla rotate, widely spreading, 2 cm. wide

Borage, *Borago officinalis*.

3b. Corolla tubular or bell-shaped —4.

4a. Leaves narrowly lanceolate, those of the stem rarely more than 1 cm. wide (flowers irregular, in lateral clusters)

Bluesweed, *Echium vulgare*.

4b. Leaves ovate-lanceolate or oblong, those of the stem regularly 2-5 cm. wide (Comfrey) —5.

5a. Hairs of the stem spreading; upper leaves decurrent on the stem

Comfrey, *Symphytum officinale*.

5b. Hairs of the stem reflexed; upper leaves not decurrent on the stem

Comfrey, *Symphytum aspernum*.

6a. Flowers reddish purple, about 8 mm. wide (5-10 dm. high; upper leaves lanceolate; late spring)

Hound's Tongue, *Cynoglossum officinale*.

6b. Flowers pale blue with yellow center, (leaves lanceolate to nearly linear; late spring, early summer) (Forget-me-not) —11.

6c. Flowers blue or pale blue —7.

6d. Flowers pale yellow, changing to blue and purple with age, 2-3 mm. wide (1-3 dm. high; late spring, early summer)

Scorpion Grass, *Myosotis versicolor*.

6e. Flowers white or yellowish —9.

7a. Corollas about 10 mm. wide (4-8 dm. high; stem-leaves oblong-lanceolate, heart-shaped at base; spring)

Wild Comfrey, *Cynoglossum virginianum*.

7b. Corollas about 5 mm. wide (3-6 dm. high; leaves lanceolate;

summer)

Bugloss, *Lycopsis arvensis*.

- 7a. Corollas about 2 mm. wide (leaves lanceolate to linear; spring to fall) —8.

- 8a. Stems diffusely spreading; fruiting calyx much enlarged, 1 cm. wide; seed-like fruits not bristly

Madwort, *Asperugo procumbens*.

- 8b. Stems erect and branching; calyx barely enlarged in fruit; seed-like fruits (usually visible toward the base of the raceme) armed with hooked bristles

Stickseed, *Lappula echinata*.

- 9a. Flowers 12-20 mm. long —5.

- 9b. Flowers less than 10 mm. long or wide —10.

- 10a. Flowers without bracts (flowers 2-3 mm. wide) (or occasionally only the very lowest of each cluster with a bract) —12.

- 10b. A small leafy bract at the base of each flower in the cluster —14.

- 11a. Corolla 4 mm. wide; calyx-lobes as long as the calyx-tube (stems decumbent, 2-5 dm. long)

Forget-me-not, *Myosotis laxa*.

- 11b. Corolla 6-8 mm. wide; calyx-lobes shorter than the calyx-tube (stems ascending, 3-6 dm. high)

Forget-me-not, *Myosotis scorpioides*.

- 12a. Principal stem-leaves sessile, linear-oblong, 10-20 mm. long (1-4 dm. high; spring)

Scorpion Grass, *Myosotis virginica*.

- 12b. Principal stem-leaves on slender petioles, 25-100 mm. long (summer) —13.

- 13a. Flowers sessile; leaves oval, obtuse (2-8 dm. high)

Heliotrope, *Heliotropium europaeum*.

- 13b. Flowers on short pedicels; stem-leaves oblong, sharply acuminate (5-10 dm. high)

Beggar Lice, *Lappula virginiana*.

- 14a. Corolla-lobes narrow and very sharp-pointed, erect (3-8 dm. high; leaves oblong to lanceolate; corolla 7-10 mm. long; late spring)

False Gromwell, *Onosmodium virginianum*.

- 14b. Corolla-lobes broad and rounded (2-8 dm. high; leaves lanceolate to linear; corolla 4-6 mm. long; spring and summer) (Corn Gromwell) —15.

- 15a. Corolla white, the seed-like fruits dull brown and wrinkled

Corn Gromwell, *Lithospermum arvense*.

- 15b. Corolla yellowish white, the seed-like fruits shining white and smooth

Corn Gromwell, *Lithospermum officinale*.

VERBENACEAE, the Verbena Family

Herbs with simple opposite leaves and slightly irregular flowers in terminal spikes; petals 5, united; stamens 4, attached to the corolla-tube; ovary 4-celled, with one style (flowers 3-6 mm. wide, summer) (Vervain).

1a. Spikes dense, continuous (flowers usually blue or purple) —2.

1b. Spikes slender, interrupted, the flowers scattered (flowers white or somewhat purple) —3.

2a. Leaves lanceolate, manifestly petioled (1-2 m. high)

Vervain, *Verbena hastata*.

2b. Leaves narrowly oblanceolate, sessile (4-7 dm. high)

Vervain, *Verbena angustifolia*.

3a. Leaves incised, tapering to a sessile base (stems spreading or ascending, 3-8 dm. long) Vervain, *Verbena officinalis*.

3b. Leaves toothed, petioled (erect, 1-2 m. high)

Vervain, *Verbena urticaefolia*.

LABIATAE, the Mint Family

Herbs with opposite leaves, square stems, and usually aromatic odor; flowers irregular with united petals, or almost regular; stamens 2 to 4, attached to the tube of the corolla; ovary deeply 4-lobed, with a single style.

Before identifying a mint, count the stamens and examine the calyx, counting the number of teeth or lobes and ascertaining their relative shape and size.

1a. Stamens 2 —2.

1b. Stamens 4 —12.

2a. Corolla regular or nearly so, 4-lobed; flowers white, 2-3 mm. wide, in dense axillary clusters; plants usually of wet grounds (2-8 dm. high; summer and autumn) —3.

2b. Corolla distinctly irregular and more or less 2-lipped —7.

3a. Calyx-teeth short, triangular, acute or obtuse (Bugle Weed) —4.

3b. Calyx-teeth narrow, acuminate or awn-pointed (leaves ovate to lanceolate) (Water Horehound) —5.

4a. Stems and stolons bearing tubers (leaves lanceolate)

Bugle Weed, *Lycopus uniflorus*.

4b. Stems and stolons not bearing tubers (leaves ovate-oblong)

Bugle Weed, *Lycopus virginicus*.

5a. Corolla about twice as long as the calyx; leaves narrowed at

base —6.

- 5b. Corolla barely longer than the calyx; leaves incised, the teeth extending more than halfway from the margin to the midrib

Water Horehound, *Lycopus americanus*.

- 6a. Leaves sessile

Water Horehound, *Lycopus sessifolius*.

- 6b. Leaves tapering to a petiole

Water Horehound, *Lycopus rubellus*.

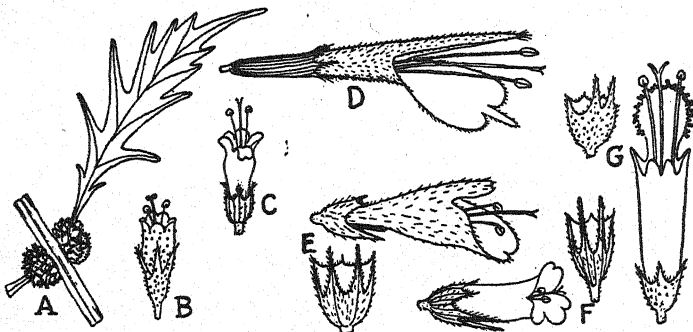


FIG. 26. Flowers of the Mint Family, illustrating numbers 1a and 2 to 11. A. *Lycopus americanus*, natural size; B. *Lycopus americanus*, $\times 4$; C. *Cunila origanoides*, $\times 2$; D. *Monarda mollis*, natural size; E. *Salvia lyrata*, natural size; F. *Hedeoma pulegioides*, $\times 4$; G. *Collinsonia canadensis*, $\times 2$.

- 7a. Corolla 3–4 mm. long; flowers blue, in loose axillary clusters (1–4 dm. high; leaves ovate or oblong; summer)

Pennyroyal, *Hedeoma pulegioides*.

- 7b. Corolla 10–12 mm. long; flowers pink-purple (2–5 dm. high; leaves ovate; late summer)

Dittany, *Cunila origanoides*.

- 7c. Corolla 10–15 mm. long; the lower lip fringed; flowers yellow (5–15 dm. high; leaves large, ovate; late summer)

Horse Balm, *Collinsonia canadensis*.

- 7d. Corolla 20–40 mm. long —8.

- 8a. Calyx narrowly tubular, its 5 lobes alike (5–10 dm. high; flowers in dense terminal heads or dense axillary clusters; summer) —9.

- 8b. Calyx bell-shaped, unequally lobed (3–10 dm. high) —11.

- 9a. Corolla scarlet (leaves ovate-lanceolate)

Oswego Tea, *Monarda didyma*.

- 9b. Corolla yellowish, spotted with purple (leaves lanceolate)
Horse Mint, *Monarda punctata*.
- 9c. Corolla pink or pale purple (leaves ovate-lanceolate to oblong)
(Wild Bergamot) —10.
- 10a. Leaves and stem grayish with fine appressed hairs
Wild Bergamot, *Monarda mollis*.
- 10b. Leaves and stem with soft spreading hairs
Wild Bergamot, *Monarda fistulosa*.
- 11a. Upper lip of the corolla much shorter than the lower; leaves mostly basal (3–8 dm. high; leaves often deeply lobed; flowers violet, late spring and early summer)
Wild Sage, *Salvia lyrata*.
- 11b. Upper lip of the corolla equaling or longer than the lower; stems leafy (5–10 dm. high; leaves broadly ovate; flowers blue and white, summer)
Clary, *Salvia sclarea*.
- 12a. Calyx with a distinct protuberance on the back of the upper side (Skullcap) —13.
- 12b. Calyx without a distinct protuberance —17.
- 13a. Corolla 5–8 mm. long; flowers in axillary racemes (3–8 dm. high; leaves ovate-lanceolate, toothed; flowers blue, summer)
Mad-dog Skullcap, *Scutellaria lateriflora*.
- 13b. Corolla 6–10 mm. long; flowers solitary in the axils of the leaves (1–3 dm. high; leaves ovate to oblong, entire; flowers violet, early summer)
Skullcap, *Scutellaria parvula*.
- 13c. Corolla 12–30 mm. long; flowers axillary or in terminal racemes (flowers blue) —14.
- 14a. Petioles of the principal stem-leaves 8–15 mm. long (leaves ovate to oblong, toothed; late spring and early summer) —15.
- 14b. Petioles of the principal stem-leaves none or not over 4 mm. long (flowers 20–30 mm. long) —16.
- 15a. Stems smooth or minutely hairy in the inflorescence; corolla about 25 mm. long
Skullcap, *Scutellaria serrata*.
- 15b. Stems hairy, glandular above; corolla about 15 mm. long
Skullcap, *Scutellaria pilosa*.
- 16a. Stem-leaves distinctly toothed, oblong-lanceolate (summer)
Skullcap, *Scutellaria galericulata*.
- 16b. Stem-leaves entire, oblong to linear (late spring and summer)
Skullcap, *Scutellaria integrifolia*.

17a. Calyx-teeth 10, subulate (woolly plant 4-10 dm. high; flowers whitish, in axillary clusters, summer)

Horehound, *Marrubium vulgare*.

17b. Calyx-teeth 5, two of them distinctly different in size and shape from the other three —18.

17c. Calyx-teeth 5, all equal or essentially so —25.

18a. Leaves linear, entire (2-4 dm. high; summer) —19.

18b. Leaves lanceolate to ovate, toothed or entire —20.

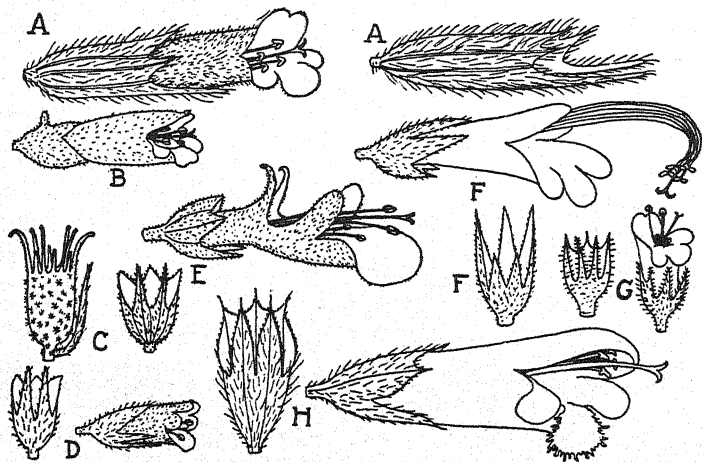


FIG. 27. Flowers of the Mint Family, illustrating numbers 12a, 13 to 16, 17a, 17b, 18 to 24. A. *Satureja vulgaris*, $\times 4$; B. *Scutellaria lateriflora*, $\times 2$; C. *Marrubium vulgare*, $\times 2$; D. *Perilla frutescens*, $\times 2$; E. *Teucrium canadense*, $\times 2$; F. *Trichostema dichotomum*, $\times 2$; G. *Thymus Serpyllum*, $\times 4$; H. *Prunella vulgaris*, $\times 2$.

19a. Three calyx-teeth larger than the other two (flowers blue to white, about 15 mm. long) **Blue Curls, *Trichostema lineare*.**

19b. Two calyx-teeth larger than the other three (flowers purple, about 5 mm. long) **Savory, *Satureja hortensis*.**

20a. Corolla deeply split on the upper side and the stamens protruding (3-6 dm. high; leaves toothed; flowers pink-purple, 15-20 mm. long, summer) (Wood Sage) —21.

20b. Corolla not deeply split down the upper side —22.

21a. Leaves ovate-lanceolate **Wood Sage, *Teucrium canadense*.**

21b. Leaves narrowly oblong

Wood Sage, *Teucrium canadense* var. *littorale*.

22a. Leaves 1 cm. long or less, entire (stems in mats, 1-3 dm. long; flowers purple, summer) Wild Thyme, *Thymus Serpyllum*.

22b. Leaves larger, toothed —23.

23a. Flowers in dense terminal oblong or cylindrical heads (1-5 dm. high or prostrate; flowers pale purple, about 10 mm. long, spring to fall) Self-heal, *Prunella vulgaris*.

23b. Flowers in open, loose, freely branched clusters (2-6 dm. high; flowers blue to white, about 15 mm. long, summer)

Blue Curls, *Trichostema dichotomum*.

23c. Flowers in terminal, or terminal and axillary slender racemes (4-10 dm. high; flowers purple or white, about 4 mm. long, summer) Perilla, *Perilla frutescens*.

23d. Flowers in loose terminal panicles, yellow —7c.

23e. Flowers in dense axillary, or axillary and terminal clusters (3-7 dm. high; summer) —24.

24a. Tube of the corolla upwardly curved (flowers white)

Lemon Balm, *Melissa officinalis*.

24b. Tube of the corolla straight (flowers purple to white)

Wild Basil, *Satureja vulgaris*.

25a. Corolla conspicuously 2-lipped, the upper lip concave and arched closely over the stamens —26.

25b. Corolla 2-lipped to nearly regular, the upper lip flattened, not arched over the stamens —33.

26a. Middle lobe of the lower lip of the corolla conspicuously notched or reverse heart-shaped (flowers in axillary clusters, often with a terminal cluster also; leaves toothed) —27.

26b. Middle lobe of the lower lip of the corolla rounded or truncate, not deeply notched —33.

27a. Stems decumbent or diffusely spreading from the base, 2-5 dm. long (spring to fall) (Dead Nettle) —28.

27b. Stems erect or nearly so (flowers purple to white, summer) —31.

28a. Corolla white (20-25 mm. long; leaves ovate)

Dead Nettle, *Lamium album*.

28b. Corolla purple-red —29.

29a. Upper leaves closely sessile or clasping, nearly round in outline (flowers 15 mm. long) Dead Nettle, *Lamium amplexicaule*.

29b. Upper leaves petioled, broadly ovate to nearly round —30.

30a. Leaves green; annuals; corolla usually 10–15 mm. long

Dead Nettle, *Lamium purpureum*.

30b. Leaves blotched with white; perennials; corolla usually 20–25 mm. long

Dead Nettle, *Lamium maculatum*.

31a. Calyx funnel-shaped, flaring at the top (4–10 dm. high; leaves broadly ovate; flowers about 15 mm. long)

Black Horehound, *Ballota nigra*.

31b. Calyx tubular or narrowly bell-shaped, not conspicuously flaring, its teeth spiny-tipped (Hemp-nettle) —32.

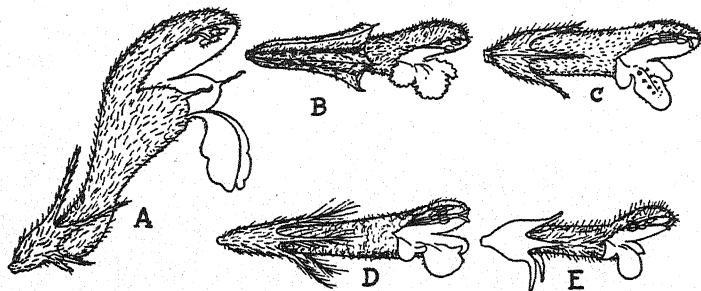


FIG. 28. Flowers of the Mint Family, illustrating numbers 25a, 26 to 37. A. *Lamium purpureum*; B. *Ballota nigra*; C. *Stachys palustris*; D. *Galeopsis Tetrahit*; E. *Leonurus Cardiaca*. All twice natural size.

32a. Leaves ovate (3–10 dm. high; flowers about 15 mm. long)

Hemp-nettle, *Galeopsis Tetrahit*.

32b. Leaves narrowly lanceolate (2–5 dm. high; flowers about 20 mm. long)

Hemp-nettle, *Galeopsis Ladanum*.

33a. Leaves palmately lobed (5–12 dm. high; flowers pink, 8–10 mm. long, summer)

Motherwort, *Leonurus Cardiaca*.

33b. Leaves toothed to entire (3–10 dm. high; flowers pale purple, mostly 10–15 mm. long, summer) (Hedge Nettle) —34.

34a. Stems hairy or bristly —35.

34b. Stems smooth, or hairy at the nodes only —37.

35a. Stems hairy only on the four angles (leaves oblong-lanceolate)

Hedge Nettle, *Stachys tenuifolia* var. *aspera*.

35b. Stems hairy also on the sides —36.

- 36a. Leaves linear-lanceolate, narrowed to the base, rarely more than 1 cm. wide **Hedge Nettle, *Stachys arenicola*.**
- 36b. Leaves oblong, rounded at the base, mostly 15-25 mm. wide **Hedge Nettle, *Stachys palustris*.**
- 37a. Leaves linear or narrowly oblong, entire or nearly so, sessile **Hedge Nettle, *Stachys hyssopifolia*.**
- 37b. Leaves ovate-lanceolate, toothed, petioled **Hedge Nettle, *Stachys tenuifolia*.**

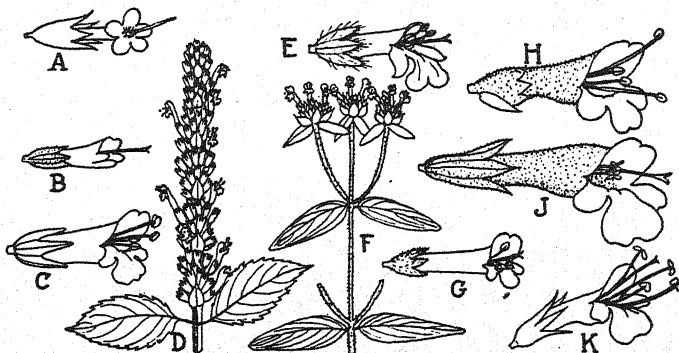


FIG. 29. Flowers of the Mint Family, illustrating numbers 25b, 38 to 55. A. *Isanthus brachiatus*; B. *Mentha arvensis* var. *canadensis*; C, D. *Agastache nepetoides*; E. *Ajuga genevensis*; F, G. *Pycnanthemum virginianum*; H. *Origanum vulgare*; J. *Nepeta hederacea*; K. *Hyssopus officinalis*. Figures D and F half natural size; all others twice natural size.

- 38a. Flowers in dense terminal spikes; corolla 2-lipped (8-15 dm. high; leaves ovate, toothed; flowers 8-12 mm. long, summer) (Giant Hyssop) —39.
- 38b. Flowers in dense terminal heads, rarely with axillary clusters below —40.
- 38c. Flowers in axillary whorls, which are sometimes aggregated into loose terminal spikes —47.
- 39a. Corolla yellowish **Giant Hyssop, *Agastache nepetoides*.**
- 39b. Corolla purplish **Giant Hyssop, *Agastache scrophulariaefolia*.**
- 40a. Principal leaves linear to narrowly lanceolate, entire (rarely with a few low scattered teeth) (3-8 dm. high; flowers small, white, or spotted with purple, summer) (Mountain Mint) —41.

40b. Principal leaves lanceolate to ovate, usually conspicuously and sharply toothed —43.

41a. Calyx-teeth broadly triangular; leaves mostly 4-10 mm. wide

Mountain Mint, *Pycnanthemum virginianum*.

41b. Calyx-teeth very sharply pointed —42.

42a. Stem smooth; leaves narrowly linear

Mountain Mint, *Pycnanthemum flexuosum*.

42b. Stem hairy; leaves narrowly lanceolate, mostly 5-8 mm. wide

Mountain Mint, *Pycnanthemum verticillatum*.

43a. Leaves sharply toothed (3-8 dm. high; flowers white, dotted with purple, summer) (Mountain Mint) —44.

43b. Leaves entire or barely crenate (3-8 dm. high; flowers purplish, mingled with purplish bracts, summer)

Wild Marjoram, *Origanum vulgare*.

44a. Calyx-teeth long-acuminate —45.

44b. Calyx-teeth short, obtuse or barely acute —46.

45a. Calyx-teeth ending in straight sharp awns; calyx and its teeth conspicuously nerved lengthwise

Mountain Mint, *Pycnanthemum aristatum*.

45b. Calyx-teeth ending in hair-like bristles; the veins of the calyx concealed beneath fine hairs

Mountain Mint, *Pycnanthemum clinopodioides*.

46a. Calyx appressed-hairy or gray with minute hairs

Mountain Mint, *Pycnanthemum incanum*.

46b. Calyx with spreading hairs

Mountain Mint, *Pycnanthemum muticum*.

47a. Corolla almost equally 5-lobed (2-5 dm. high; leaves lanceolate, mostly entire; flowers blue, about 5 mm. long, summer)

False Pennyroyal, *Isanthus brachiatus*.

47b. Corolla irregular and 2-lipped, but the upper lip very much smaller than the lower or apparently wanting (1-3 dm. high; stem-leaves oblong; flowers blue, 12-18 mm. long, summer) (Bugle Weed) —48.

47c. Corolla irregular and 2-lipped, the upper lip at least half as long as the lower —49.

47d. Corolla almost equally 4-lobed, the upper lobe somewhat notched (summer; flowers pink-purple to white) (Mint) —50.

48a. Stems softly covered with long hairs

Bugle Weed, *Ajuga genevensis*.

- 48b. Stems thinly hairy or glabrous **Bugle Weed, Ajuga reptans.**
 49a. Leaves linear-oblong, entire, sessile or nearly so (3-8 dm. high;
 flowers blue, 10 mm. long, summer)

Hyssop, Hyssopus officinalis.

- 49b. Leaves ovate to oblong, acute, toothed, petioled (5-10 dm.
 high; flowers pink-purple, 10-12 mm. long, summer)

Catnip, Nepeta Cataria.

- 49c. Leaves nearly circular or kidney-shaped, toothed, petioled (trail-
 ing; flowers blue, about 15 mm. long, spring)

Ground Ivy, Nepeta hederacea.

- 50a. Flowers in terminal spikes, or the lower also axillary —51.

- 50b. Flowers all in axillary whorls (2-8 dm. high) —54.

- 51a. Principal leaves sessile or nearly so (3-5 dm. high) —52.

- 51b. Principal leaves petioled (3-8 dm. high) —53.

- 52a. Stem smooth

Spearmint, Mentha spicata.

- 52b. Stem minutely hairy

Horse Mint, Mentha longifolia.

- 52c. Stem softly hairy

Mint, Mentha rotundifolia.

- 53a. Plants smooth or nearly so

Peppermint, Mentha piperita.

- 53b. Plants more or less hairy

Curled Mint, Mentha crispa.

- 54a. Stems smooth or with a few scattered hairs

Mint, Mentha gentilis.

- 54b. Stems decidedly hairy —55.

- 55a. Leaves rounded at the base, oblong or ovate

Mint, Mentha arvensis.

- 55b. Leaves tapering to the base, lanceolate or oblong-lanceolate

Mint, Mentha arvensis var. canadensis.

SOLANACEAE, the Nightshade Family

Herbs or shrubs, with alternate leaves and regular or slightly irregular flowers; sepals 5, united; petals 5, united; stamens 5, attached to the corolla; ovary 2-5-celled (usually 2-celled), with one slender style.

- 1a. Stems climbing or trailing, shrubby, with narrowly lanceolate entire leaves and greenish purple flowers about 1 cm. wide (summer)

Matrimony Vine, Lycium halimifolium.

- 1b. Stems climbing or trailing, herbaceous, with ovate, frequently 2-3-lobed leaves and blue, purple, or white flowers 10-15 mm.

wide (late spring and summer)

Bittersweet, *Solanum Dulcamara*.

1c. Stems herbaceous, not climbing or trailing, but sometimes prostrate on the ground —2.

2a. Corollas yellow or greenish yellow —3.

2b. Corollas blue, violet, red, or white, or intermediate shades —10.

3a. Corolla wheel-shaped, spreading horizontally, the anthers all close together in a projecting cone (leaves lobed or divided; summer) —4.

3b. Corolla more or less funnel-shaped, the anthers distinctly separate from each other —5.

4a. Stems prickly (3-8 dm. high; flowers 25 mm. wide)

Buffalo Bur, *Solanum rostratum*.

4b. Stems hairy but not prickly (5-15 dm. high; flowers 10-15 mm. wide)

Tomato, *Lycopersicon esculentum*.

5a. Flowers axillary —6.

5b. Flowers in large terminal panicles (6-12 dm. high; leaves broadly ovate; flowers 25 mm. long, summer)

Wild Tobacco, *Nicotiana rustica*.

6a. Leaves sessile, deeply toothed; flowers 30 mm. wide, the corolla marked with purplish veins (3-8 dm. high; summer)

Henbane, *Hyoscyamus niger*.

6b. Leaves petioled, ovate-lanceolate to ovate; flowers broadly funnel-form, usually darker in the center, 25 mm. wide or smaller (5-10 mm. high, freely branched; summer) (Ground Cherry) —7.

7a. Corolla about 1 cm. broad; leaves hairy, heart-shaped at base

Ground Cherry, *Physalis pruinosa*.

7b. Corolla 15-25 mm. wide —8.

8a. Leaves rounded or truncate at the base, beset with glandular hairs

Ground Cherry, *Physalis heterophylla*.

8b. Leaves acute or tapering at the base —9.

9a. Hairs of the stem none or appressed

Ground Cherry, *Physalis subglabrata*.

9b. Hairs of the stem spreading

Ground Cherry, *Physalis virginiana*.

10a. Corolla wheel-shaped, 1-2 cm. wide, white (3-10 dm. high; summer and fall) —11.

- 10b. Corolla funnel-shaped, about 3 cm. long and wide, pale blue (5-10 dm. high; leaves ovate; summer)
Apple-of-Peru, Nicandra Physalodes.
- 10c. Corolla broadly tubular or trumpet-shaped, at least 10 cm. long, white to pale blue (5-12 dm. high; leaves large, ovate; summer) (Jimson Weed) —12.
- 11a. Stems prickly (leaves ovate-oblong, deeply toothed; flowers 20-25 mm. wide) **Horse Nettle, Solanum carolinense.**
- 11b. Stems not prickly (leaves ovate, nearly or quite entire; flowers about 10 mm. wide) **Nightshade, Solanum nigrum.**
- 12a. Flowers white; stem green
Jimson Weed, Datura Stramonium.
- 12b. Flowers pale violet; stem purple
Jimson Weed, Datura Tatula.

SCROPHULARIACEAE, the Figwort Family

Herbs (one species a tree), with opposite, alternate, or whorled leaves and usually irregular flowers; corolla of united petals, bearing the 2, 4, or rarely 5, stamens attached; petals actually 5, but sometimes apparently only 2 or 4; a sterile fifth stamen sometimes present; ovary superior, 2-celled.

- 1a. Anther-bearing stamens 5, some or all of the filaments woolly; flowers nearly or quite regular, the corolla rotate, 5-lobed, 2-3 cm. wide (4-15 dm. high; summer) (Mullein) —2.
- 1b. Anther-bearing stamens 4; a sterile fifth stamen may or may not be present —4.
- 1c. Anther-bearing stamens 2 —32.
- 2a. Flowers in racemes, yellow or bluish white; leaves sessile, oblong to lanceolate, smooth or nearly so
Moth Mullein, Verbascum Blattaria.
- 2b. Flowers in crowded spikes, nearly or quite sessile, yellow; leaves densely woolly —3.
- 3a. Leaves long-decurrent on the stem
Mullein, Verbascum Thapsus.
- 3b. Leaves sessile or very shortly decurrent
Mullein, Verbascum phlomoides.
- 4a. Aquatic or swamp herb with linear basal leaves and minute white or pink flowers 2 mm. wide (5 cm. high; summer)
Mudwort, Limosella aquatica var. tenuifolia.

4b. Land or marsh herbs with leafy stems and usually larger flowers —5.

4c. Tree, with heart-shaped leaves and terminal panicles of violet flowers 5 cm. long in late spring

Empress Tree, *Paulownia tomentosa*.

5a. Corolla with a slender spur at the base —6.

5b. Corolla without a spur —8.

6a. Leaves triangular-hastate (prostrate; flowers yellow and purple, 6-8 mm. long, summer) Toad-flax, *Linaria elatine*.

6b. Leaves round-ovate (prostrate; flowers yellow and purple, about 5 mm. long, summer) Toad-flax, *Linaria spuria*.

6c. Leaves palmately 3-5-lobed (trailing; flowers blue or lilac, about 10 mm. long, summer)

Kenilworth Ivy, *Linaria cymbalaria*.

6d. Leaves linear —7.

7a. Corolla mostly yellow, 2-3 cm. long (3-8 dm. high; late spring to fall) Butter-and-eggs, *Linaria vulgaris*.

7b. Corolla mostly blue or purple, less than 1 cm. long (2-7 dm. high; late spring, early summer)

Toad-flax, *Linaria canadensis*.

8a. Corollas wholly or mostly yellow, greenish yellow, or orange (bracts of a different color may be present) —9.

8b. Corollas brown, blue, purple, red, green, or white, but not yellow —17.

9a. Flowers in dense terminal leafy-bracted spikes; stem-leaves deeply lobed or very coarsely toothed —10.

9b. Flowers in loose racemes, loose open spikes, panicles, or axillary (summer) —12.

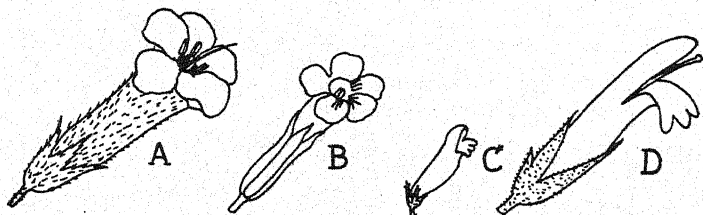


FIG. 30. Flowers of the Figwort Family, illustrating numbers 12 to 16, all natural size. A. *Gerardia pedicularia*; B. *Mimulus moschatus*; C. *Melampyrum lineare*; D. *Schwalbea americana*.

- 10a. Stem-leaves palmately lobed; bracteal leaves scarlet (3-6 dm. high; flowers 20-25 mm. long, late spring)
Painted Cup, Castilleja coccinea.
- 10b. Stem-leaves pinnately toothed or lobed; bracteal leaves green (flowers 15-20 mm. long) (Lousewort) —11.
- 11a. Flowers in spring (1-4 dm. high)
Lousewort, Pedicularis canadensis.
- 11b. Flowers in late summer (3-8 dm. high)
Lousewort, Pedicularis lanceolata.
- 12a. Upper two lobes of the corolla resembling the lower three in shape and not much different in size; flowers 15-25 mm. long —13.
- 12b. Upper two lobes of the corolla conspicuously different from the lower three in size or shape or both —16.
- 13a. Flowers axillary, strongly scented of musk (in wet ground; stems spreading and ascending, 2-3 dm. long; leaves oblong-ovate)
Musk Flower, Mimulus moschatus.
- 13b. Flowers in terminal leafy racemes, not musk-scented (in woods or dry ground; stems erect, 4-12 dm. high; leaves often coarsely toothed or lobed) (False Foxglove) —14.
- 14a. Stem smooth
False Foxglove, Gerardia virginica.
- 14b. Stem hairy —15.
- 15a. Corolla hairy on the outside
False Foxglove, Gerardia pedicularia.
- 15b. Corolla smooth on the outside
False Foxglove, Gerardia flava.
- 16a. Corolla about 1 cm. long; leaves lanceolate, with 1 principal vein, the uppermost often toothed (1-4 dm. high; flowers white and yellow)
Cow Wheat, Melampyrum lineare.
- 16b. Corolla about 3 cm. long; leaves entire, the lower with 3 principal veins (3-5 dm. high; flowers yellowish purple)
Chaff-seed, Schwalbea americana.
- 17a. Upper two petals of the corolla resembling the lower three in size, shape and general position (1-6 dm. high; leaves linear or narrowly lanceolate; flowers rose-purple, 1-3 cm. long, late summer) (Gerardia) —18.
- 17b. Upper two petals quite different from the lower three in size, shape, or position (corolla very rarely rose-purple, and if so, then very irregular in shape) —23.

18a. Pedicels equaling or but little longer than the calyx and much shorter than the subtending leaf —19.

18b. Pedicels much longer than the calyx and generally equaling or exceeding the subtending leaf —21.

19a. Corolla 25–30 mm. long

Gerardia, *Gerardia purpurea*.

19b. Corolla 10–18 mm. long —20.

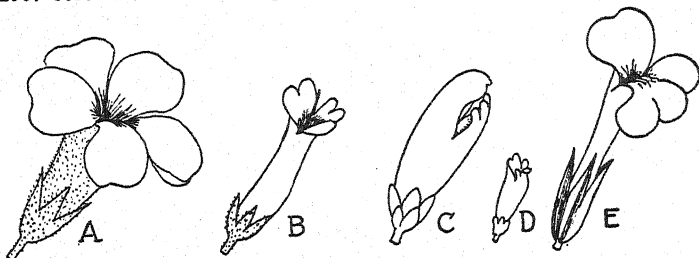


FIG. 31. Flowers of the Figwort Family, illustrating numbers 17 to 31, all natural size. A. *Gerardia purpurea*; B. *Pentstemon hirsutus*; C. *Chelone glabra*; D. *Scrophularia marilandica*; E. *Mimulus ringens*.

20a. Calyx-lobes sharp-pointed, lanceolate

Gerardia, *Gerardia paupercula*.

20b. Calyx-lobes very short and blunt

Gerardia, *Gerardia maritima*.

21a. Lobes of the corolla reverse heart-shaped

Gerardia, *Gerardia parvifolia*.

21b. Lobes of the corolla rounded or minutely notched at the end —22.

22a. Leaves flat; corolla smooth within

Gerardia, *Gerardia tenuifolia*.

22b. Leaves filiform or with revolute margins; corolla hairy within

Gerardia, *Gerardia setacea*.

23a. Corollas 6–12 mm. long (summer) —24.

23b. Corollas showy, 20–40 mm. long —26.

24a. Stem 2–4 dm. high; flowers white and cream, solitary or in small clusters —16a.

24b. Stems 10–25 dm. high; flowers greenish brown to purple-brown, in large terminal panicles; leaves ovate-lanceolate (Figwort) —25.

- 25a. Sterile stamen deep purple **Figwort, Scrophularia marilandica.**
- 25b. Sterile stamen greenish yellow **Figwort, Scrophularia leprellia.**
- 26a. Flowers axillary, blue or violet (3-10 dm. high; leaves ovate-lanceolate to oblong; summer) (**Monkey Flower**)—27.
- 26b. Flowers in terminal racemes, spikes, or panicles, or in loose and open clusters —28.
- 26c. Flowers in dense crowded head-like spikes, white or pinkish (3-10 dm. high; leaves lanceolate; summer)
Turtlehead, Chelone glabra.
- 27a. Leaves sessile and clasping at the base
Monkey Flower, Mimulus ringens.
- 27b. Leaves petioled, not clasping **Monkey Flower, Mimulus alatus.**
- 28a. Stem-leaves alternate (3-8 dm. high; summer)—29.
- 28b. Stem-leaves opposite, oblanceolate to oblong (flowers white to pale purple) (**Beard-tongue**)—30.
- 29a. Stem-leaves with 3 principal veins (flowers yellow and purple)—16b.
- 29b. Stem-leaves pinnately veined, oblong-lanceolate, with 1 midvein
Snapdragon, Antirrhinum majus.
- 30a. Stem below the flower-cluster smooth (7-15 dm. high; early summer)—31.
- 30b. Stem finely hairy (4-8 dm. high; late spring)
Beard-tongue, Pentstemon hirsutus.
- 31a. Corolla-tube gradually enlarged from base to summit
Beard-tongue, Pentstemon laevigatus.
- 31b. Corolla-tube abruptly expanded just above the base of the calyx
Beard-tongue, Pentstemon laevigatus var. Digitalis.
- 32a. Corolla 2-lipped, the upper and lower lips distinctly unequal (stems 1-4 dm. high or long; flowers axillary, summer)—33.
- 32b. Corolla regular or nearly so, 4-lobed —36.
- 33a. Corolla pale purple; leaves with 3 principal veins, elliptical to ovate or oblong; flowers 5-10 mm. long (**False Pimpernel**)—34.
- 33b. At least the corolla-tube yellow or yellowish; leaves with 1 principal midvein, lanceolate or oblong-lanceolate; flowers 8-15 mm. long (**Hedge Hyssop**)—35.
- 34a. Lower flower-stalks not longer than the subtending leaves
False Pimpernel, Lysanthes dubia.

- 34b. Lower flower-stalks much exceeding the subtending leaves
False Pimpernel, *Lysanthes anagallidea*.
- 35a. Lobes of the corolla bright yellow
Hedge Hyssop, *Gratiola aurea*.
- 35b. Lobes of the corolla white or nearly so
Hedge Hyssop, *Gratiola virginiana*.
- 36a. Leaves whorled, lanceolate (6-20 dm. high; flowers white to pale blue, 4-5 mm. long, summer)
Culver's Root, *Veronica virginica*.
- 36b. Leaves opposite or alternate —37.
- 37a. Flowers in racemes which arise from the axils of the opposite leaves —38.
- 37b. Flowers solitary in the axils of the leaf-like bracts or in terminal racemes (spring and summer) (Speedwell) —42.
- 38a. Stem and foliage smooth; plants of swamps, wet grounds, or water (flowers white to pale blue, 4-7 mm. wide, summer) —39.
- 38b. Stem and foliage hairy; plants of dry ground (1-3 dm. high, mostly ascending; flowers pale blue, 4-8 mm. wide, spring and summer) (Speedwell) —41.
- 39a. Leaves linear or narrowly lanceolate (stems decumbent, 2-6 dm. long)
Marsh Speedwell, *Veronica scutellata*.
- 39b. Leaves ovate or ovate-lanceolate —40.
- 40a. Stem-leaves sessile or somewhat clasping (3-9 dm. high)
Water Speedwell, *Veronica Anagallis-aquatica*.
- 40b. Stem-leaves on short petioles (1-9 dm. high)
Brooklime, *Veronica americana*.
- 41a. Leaves elliptical, narrowed at the base into a petiole
Speedwell, *Veronica officinalis*.
- 41b. Leaves ovate, rounded or heart-shaped at the base
Speedwell, *Veronica Chamaedrys*.
- 42a. Bracteal leaves entire (stems 1-3 dm. long) —43.
- 42b. Leaves all toothed (stems 1-5 dm. long, decumbent or ascending; flowers blue or white) —44.
- 43a. Flowers white, about 2 mm. wide (usually erect; leaves oblong-linear)
Speedwell, *Veronica peregrina*.
- 43b. Flowers pale blue with darker stripes, 3-4 mm. wide (usually decumbent; leaves ovate or oblong)
Speedwell, *Veronica serpyllifolia*.

- 44a. Flowers nearly sessile, about 2 mm. wide (leaves ovate)
Speedwell, *Veronica arvensis*.
- 44b. Flowers on slender pedicels —45.
- 45a. Leaves circular in outline, with 3-5 large teeth or lobes (flowers
4 mm. wide) Speedwell, *Veronica hederacfolia*.
- 45b. Leaves ovate or oval in outline, with several small teeth —46.
- 46a. Corolla not longer than the calyx
Speedwell, *Veronica agrestis*.
- 46b. Corolla distinctly longer than the calyx, 6-8 mm. wide
Speedwell, *Veronica Tournefortii*

LENTIBULARIACEAE, the Bladderwort Family

Small delicate herbs, growing in mud or water; calyx and corolla both 2-lipped; stamens 2, attached to the corolla; ovary 1-celled (summer) (Bladderwort).

- 1a. Plants all or mostly submerged under water, the leaves dissected into capillary divisions and bearing small bladders on their lobes —2.
- 1b. Plants of sandy or muddy shores, with solitary, slender, erect stems, the leaves minute, grasslike, or usually wanting —5.
- 2a. Flowers violet-purple Bladderwort, *Utricularia purpurea*.
- 2b. Flowers yellow —3.
- 3a. Petioles of the leaves expanded into large inflated bladders, serving as floats Bladderwort, *Utricularia inflata*.
- 3b. Petioles of the leaves not expanded into floats —4.
- 4a. The common species, with densely leafy floating stems as much as a meter long, is
Bladderwort, *Utricularia vulgaris* var. *americana*.
- 4b. The rare species, mostly with few and small leaves close to the bottom of the water, are *Utricularia clandestina*, *U. minor*, *U. biflora*, *U. gibba*, *U. intermedia*, and *U. fibrosa*.
- 5a. Flowers purple Bladderwort, *Utricularia resupinata*.
- 5b. Flowers yellow Bladderwort, *Utricularia cornuta*.

OROBANCHACEAE, the Broom-rape Family

Parasitic plants, without green color and with scales in place of leaves; corolla 2-lipped, of united petals; stamens 4, attached to the corolla.

- 1a. Flowers solitary on long erect naked stalks (1-2 dm. high; flowers white to violet, about 2 cm. long, late spring)

Cancer-root, *Orobanche uniflora*.

- 1b. Flowers 10-15 mm. long, in a spike on an unbranched stem (1-3 dm. high; early summer) —2.

- 1c. Flowers in a branching panicle (1-5 dm. high, parasitic on beech; flowers white and purple, about 10 mm. long; late summer)

Beech-drops, *Epifagus virginiana*.

- 2a. Parasitic on clover (flowers bluish)

Broom-rape, *Orobanche minor*.

- 2b. Growing in leaf-mold in woods, usually near the base of a tree (whole plant yellow or pale brown, covered with scales)

Squaw-root, *Conopholis americana*.

BIGNONIACEAE, the Bignonia Family

Trees or woody climbing vines with showy flowers; corolla irregular, the petals united; stamens 4, attached to the corolla; leaves opposite or whorled; fruit a long pod.

- 1a. Climbing or trailing vine with pinnately compound leaves (flowers trumpet-shaped, 6-8 cm. long, orange and red, summer)

Trumpet Creeper, *Tecoma radicans*.

- 1b. Trees with simple heart-shaped leaves (flowers bell-shaped, white, mottled with yellow and violet, 3-4 cm. long, late spring and summer)

Catalpa, *Catalpa bignonioides*.

PHYRMACEAE, the Lopseed Family

Herb with opposite leaves and irregular flowers in long slender spikes; petals united, corolla 2-lipped; stamens 4, attached to the corolla; ovary 1-celled.

1. 5-10 dm. high; leaves ovate; flowers purple, 5-8 mm. long, summer

Lopseed, *Phryma leptostachya*.

PLANTAGINACEAE, the Plantain Family

Herbs, with basal leaves and small greenish or white flowers in close spikes; sepals 4; petals 4, dry and membranous, united; stamens 4 or rarely 2, on very long protruding filaments; ovary 2-celled; style 1.

- 1a. Leaves linear, never more than 1 cm. wide, and seldom more than 5 mm. (1-4 dm. high; late spring and summer) —2.

- 1b. Leaves broader, lanceolate to broadly ovate or heart-shaped, with 3 or more prominent longitudinal veins, or pinnately veined (late spring and summer) (Plantain) —4.
- 2a. Spikes mixed with bracts several times as long as the flowers (1-4 dm. tall) **Buckhorn, *Plantago aristata*.**
- 2b. Bracts not longer than the flowers (Plantain) —3.
- 3a. Salt-marsh plant; leaves rather thick and fleshy, 2-5 mm. wide (1-4 dm. high) **Plantain, *Plantago decipiens*.**
- 3b. Plant of sandy soil; leaves filiform, about 1 mm. wide (1-2 dm. high) **Plantain, *Plantago elongata*.**
- 4a. Leaves pinnately veined, heart-shaped at base (3-5 dm. high) **Plantain, *Plantago cordata*.**
- 4b. Leaves with 3-many longitudinal ribs or veins —5.
- 5a. Leaves densely gray-hairy (1-4 dm. high) **Plantain, *Plantago virginica*.**
- 5b. Leaves smooth or very slightly hairy —6.
- 6a. Flower-stalks 3-6 dm. high; spikes not more than 10 cm. long; leaves narrowly lanceolate **Plantain, *Plantago lanceolata*.**
- 6b. Flower-stalks 1-4 dm. high; spikes long and slender; leaves broadly oval or elliptical —7.
- 7a. Leaves green at the very base of the stalk **Plantain, *Plantago major*.**
- 7b. Leaves reddish or purple at base of the stalk **Plantain, *Plantago Rugelii*.**

RUBIACEAE, the Madder Family

Herbs or shrubs, with opposite or whorled leaves and small regular flowers; sepals 4, or minute, or almost wanting; petals 4, united; stamens 4; ovary inferior.

- 1a. Shrub with ovate-oblong leaves (1-3 m. tall; flowers white, in dense spherical heads about 3 cm. in diameter, summer) **Button Bush, *Cephalanthus occidentalis*.**
- 1b. Herbs —2.
- 2a. Leaves opposite —3.
- 2b. Leaves in whorls of 4-8 (flowers seldom more than 3 mm. wide) —7.
- 3a. Flowers sessile in the axils of the leaves —4.
- 3b. Flowers pedicelled, terminal, or in terminal clusters —5.

- 4a. Leaves oval, less than 2 cm. long; corolla white, about 2 mm. long, shorter than the calyx (1-4 dm. high, summer)

Oldenlandia, Oldenlandia uniflora.

- 4b. Leaves linear-lanceolate, stiff, mostly 3-4 cm. long; corolla pink or purplish, 5 mm. long, longer than the calyx (1-5 dm. high, or spreading on the ground, summer)

Button Weed, Diodia teres.

- 5a. Leaves about as long as wide; flowers paired, united by their ovaries (trailing; flowers white, 1 cm. wide, summer)

Partridge Berry, Mitchella repens.

- 5b. Leaves at least twice as long as wide —6.

- 6a. Corolla salver-form, about 10 mm. wide; flower-stalks 1-flowered (about 1 dm. high; flowers blue or white with yellow center, spring)

Bluets, Houstonia caerulea.

- 6b. Corolla funnel-form, about 5 mm. wide; flowers in clusters (1-3 dm. high; flowers white or pale blue, late spring and summer)

Houstonia, Houstonia longifolia.

- 7a. Flowers yellow, in dense panicles (2-6 dm. high; leaves linear, in 6's or 8's; spring and summer)

Bedstraw, Galium verum.

- 7b. Flowers white, greenish, or slightly purplish (spring or summer) (Bedstraw) —8.

- 7c. Flowers pink or blue, in stalked heads subtended by an involucre (stems 1-2 dm. long; leaves lanceolate; summer)

Field Madder, Sherardia arvensis.

- 8a. Leaves in whorls of 4 (stems 2-6 dm. long, spreading, ascending, or nearly erect; late spring and summer) —9.

- 8b. Leaves in whorls of 5 or more —15.

- 9a. Ovary and fruit bristly with hooked prickles (leaves oval to lanceolate) —10.

- 9b. Ovary and fruit smooth —13.

- 10a. Leaves with one principal vein *Bedstraw, Galium pilosum.*

- 10b. Leaves with 3 principal veins —11.

- 11a. Flowers bright white, in conspicuous terminal panicles

Bedstraw, Galium boreale.

- 11b. Flowers greenish or purplish, in few-flowered clusters —12.

- 12a. Leaves oval-oblong, obtuse or barely acute

Bedstraw, Galium circaezans.

- 12b. Leaves lanceolate, sharply acuminate

Bedstraw, Galium lanceolatum.

- 13a. Petals 3 Bedstraw, *Galium Claytoni*.
13b. Petals 4; flowers in conspicuous terminal panicles; leaves 3-veined —11a.
13c. Petals 4; flowers in small loose clusters; leaves 1-veined —14.
14a. Flowers several in small branching clusters Bedstraw, *Galium palustre*.
14b. Flowers solitary, or in irregular clusters of 2-5 Bedstraw, *Galium tinctorium*.
15a. Ovary and fruit bristly —16.
15b. Ovary and fruit smooth or roughened, but not bristly —17.
16a. Stems smooth or a trifle roughened, diffusely spreading or ascending (summer) Bedstraw, *Galium triflorum*.
16b. Stems strongly roughened, leaning on other plants (spring and summer) Bedstraw, *Galium Aparine*.
17a. Stems erect; flowers very numerous (late spring and summer; 2-6 dm. high) —18.
17b. Stems prostrate, declined, or ascending, usually rough on the angles (late spring and summer) —19.
18a. Branches of the inflorescence erect or nearly so Bedstraw, *Galium erectum*.
18b. Branches of the inflorescence strongly spreading Bedstraw, *Galium Mollugo*.
19a. Leaves obtuse and sometimes also minutely mucronate (stems 2-5 dm. long) —13.
19b. Leaves sharply mucronate —20.
20a. Flowers in small axillary clusters (2-4 dm. high) Bedstraw, *Galium tricornis*.
20b. Flowers in small loose terminal clusters (stems strongly roughened, reclining on bushes, 5-15 dm. long) Bedstraw, *Galium asprellum*.

CAPRIFOLIACEAE, the Honeysuckle Family

Shrubs or herbs, with opposite leaves; corolla regular or irregular; petals 4 or 5, united; stamens 4 or 5; ovary inferior, 1-5-celled; distinguished from the Madder Family chiefly by the absence of stipules.

- 1a. Leaves pinnately compound (shrubs 1-4 m. high; flowers small, about 4 mm. wide, white, in large clusters, in early summer) (Elder) —2.

1b. Leaves simple —3.

2a. Pith of the twigs white; inflorescence flattened or convex
Elder, Sambucus canadensis.

2b. Pith of the twigs brown; inflorescence pyramidal
Elder, Sambucus racemosa.

3a. Low trailing herb; flowers pink, about 1 cm. long, nodding, in pairs (1 dm. high; leaves broadly oval; summer)

Twin Flower, Linnaea borealis var. americana.

3b. Erect herbs (6-12 dm. high; flowers axillary, dull red or greenish, 1-2 cm. long, early summer) (Feverwort) —4.

3c. Twining woody vines (spring and early summer) (Honeysuckle) —6.

3d. Erect shrubs or small trees —9.

4a. Leaf-bases broadly connate and 2-5 cm. wide
Feverwort, Triosteum perfoliatum.

4b. Leaf-bases narrowly connate, not over 1 cm. wide —5.

5a. Flowers purplish red **Feverwort, Triosteum aurantiacum.**

5b. Flowers greenish yellow **Feverwort, Triosteum angustifolium.**

6a. Flowers in 2-flowered axillary clusters (leaves ovate, all separate; flowers white to pink or yellow, about 25 mm. long)
Japanese Honeysuckle, Lonicera japonica.

6b. Flowers in small terminal heads or spikes (leaves ovate to oblong, the pair beneath the flowers connate at base; flowers 2-4 cm. long) —7.

7a. Corolla 2-lipped, the upper lip 4-lobed, the lower entire —8.

7b. Corolla about uniformly 5-lobed, red without, yellow within
Trumpet Honeysuckle, Lonicera sempervirens.

8a. Corolla purple on the outside
Honeysuckle, Lonicera Caprifolium.

8b. Corolla yellow on the outside **Honeysuckle, Lonicera dioica.**

9a. Corolla tubular at the base; style long and slender —10.

9b. Corolla rotate or somewhat bell-shaped; style very short (flowers small, white, late spring or early summer) —14.

10a. Flowers yellow or yellowish —11.

10b. Flowers white or pink —12.

11a. Leaves toothed; flowers 1.5-2 cm. long, separate in the clusters (5-10 dm. high; leaves ovate-oblong; late spring)

Bush Honeysuckle, Diervilla Lonicera.

- 11b. Leaves entire; flowers about 15 mm. long, in pairs with the ovaries united or very close together (5-10 dm. high; leaves oval; - early summer)

Fly Honeysuckle, *Lonicera caerulea* var. *villosa*.

- 12a. Corolla irregular, about 2 cm. long (1-4 m. high; spring)

Honeysuckle, *Lonicera tatarica*.

- 12b. Corolla regular, not more than 1 cm. long (5-15 dm. high; flowers white or pink, in axillary clusters, early summer) —13.

- 13a. Flowers numerous in each cluster

Indian Currant, *Symphoricarpos orbiculatus*.

- 13b. Flowers 1 or 2 in each axillary cluster

Snowberry, *Symphoricarpos racemosus*.

- 14a. Leaves palmately lobed —15.

- 14b. Leaves not lobed —16.

- 15a. Outermost flowers of the cluster enlarged and imperfect

Cranberry Tree, *Viburnum Opulus* var. *americanum*.

- 15b. All flowers of the cluster alike

Arrow Wood, *Viburnum acerifolium*.

- 16a. Outermost flowers of the cluster enlarged and imperfect (leaves broadly oval or nearly round)

Hobble-bush, *Viburnum alnifolium*.

- 16b. All flowers of the cluster alike —17.

- 17a. Leaves broadly ovate, coarsely toothed, all or most of the prominent veins terminating in a tooth —18.

- 17b. Leaves finely toothed or entire, the veins inconspicuous —20.

- 18a. Leaves smooth beneath, or with small tufts of hairs at the base of the veins

Arrow Wood, *Viburnum dentatum*.

- 18b. Leaves hairy on the surface beneath —19.

- 19a. Leaves velvety-hairy beneath

Arrow Wood, *Viburnum pubescens*.

- 19b. Leaves beset with branched hairs beneath

Arrow Wood, *Viburnum venosum*.

- 20a. Umbels of flowers on stalks 1 cm. long or less —21.

- 20b. Umbels on stalks at least 2 cm. long —22.

- 21a. Leaves distinctly acuminate to the tip

Sheep-berry, *Viburnum Lentago*.

- 21b. Leaves obtuse or barely acute

Black Haw, *Viburnum prunifolium*.

22a. Leaves glossy above, entire Withe-rod, *Viburnum nudum*.

22b. Leaves dull green above, finely toothed
Withe-rod, *Viburnum cassinoides*.

VALERIANACEAE, the Valerian Family

Herbs with opposite leaves and small (2-5 mm. long) nearly or quite regular flowers; petals 5, united; stamens 3; sepals minute or wanting; ovary inferior.

1a. Stem-leaves pinnately cleft (5-10 dm. high; flowers white or pink, summer) Valerian, *Valeriana officinalis*.

1b. Stem-leaves oblong, entire or toothed (2-3 dm. high; flowers blue, spring and early summer)

Corn Salad, *Valerianella Locusta*.

DIPSACACEAE, the Teasel Family

Herbs, with opposite leaves, and small pale blue flowers aggregated in dense terminal heads subtended by an involucre; calyx minute; petals 4, united; stamens 4, attached to the corolla, with separate anthers; ovary inferior.

1. Herb 1-2 m. high, with lanceolate leaves and prickly stem (summer)
Teasel, *Dipsacus sylvestris*.

CUCURBITACEAE, the Gourd Family

Herbs, climbing by tendrils, with alternate palmately lobed leaves and imperfect flowers; staminate flowers in showy clusters, with 5-6 petals and 3 stamens; pistillate flowers small.

1a. Leaves 5-angled or shallowly 5-lobed (flowers white, summer)
Bur Cucumber, *Sicyos angulatus*.

1b. Leaves 5-lobed to about the middle (commonly cultivated and frequently wild; flowers white, summer)

Wild Balsam-apple, *Echinocystis lobata*.

CAMPANULACEAE, the Bellflower Family

Herbs, with alternate simple leaves and milky juice; sepals 5; petals 5, united; stamens 5, attached to the very base of the corolla; ovary inferior.

1a. Stem-leaves circular or nearly so, heart-shaped at the clasping base (2-5 dm. high; flowers axillary, blue, 1-2 cm. wide, late spring and summer) Venus's Looking Glass, *Specularia perfoliata*.

- 1b. Stem-leaves linear or nearly so, not more than 1 cm. wide —2.
 1c. Stem-leaves ovate to lanceolate, 2 cm. or more wide (flowers blue, in a terminal spike or raceme, summer) (Bellflower) —4.
 2a. Flowers in dense heads, blue (2-5 dm. high; summer)
 Sheep's-bit, Jasione montana.
 2b. Flowers solitary or in short racemes (summer) —3.
 3a. Stem and leaves smooth (1-6 dm. high; flowers blue, 15-25 mm. long)
 Harebell, Campanula rotundifolia.
 3b. Stem and leaves rough with reflexed bristles (marsh plant with weak slender stems 3-10 dm. long; flowers white or pale blue, 5-8 mm. long)
 Marsh Bellflower, Campanula aparinoides.
 4a. Corolla rotate, about 25 mm. wide; flowers in spikes (6-15 dm. high)
 Bellflower, Campanula americana.
 4b. Corolla bell-shaped, 2-3 cm. long; flowers in one-sided racemes (4-10 dm. high)
 Bellflower, Campanula rapunculoides.

LOBELIACEAE, the Lobelia Family

Herbs with alternate or basal simple leaves and milky juice; flowers irregular; petals 5, united; corolla split down the upper side; stamens 5, united by their anthers into a ring or tube surrounding the style; ovary 2-celled, inferior (summer and autumn).

- 1a. Leaves all basal, tubular, 3-5 cm. long; flowers on leafless stalks (aquatic, 1-4 dm. high; flowers blue, about 15 mm. long)
 Water Lobelia, Lobelia Dortmanna.
 1b. Leaves normal, on the stem; land plants, often growing in wet places —2.
 2a. Flowers 2 cm. long or longer, in dense terminal racemes (5-10 dm. high) —3.
 2b. Flowers about 1 cm. long or shorter (flowers light blue) —5.
 3a. Flowers scarlet
 Cardinal Flower, Lobelia cardinalis.
 3b. Flowers blue —4.
 4a. Leaves and stem smooth or with a few scattered hairs
 Great Lobelia, Lobelia siphilitica.
 4b. Leaves and stem finely and softly hairy
 — Lobelia, Lobelia puberula.
 5a. Flowers nearly sessile, in slender, stiff, terminal, spike-like racemes (4-10 dm. high, usually unbranched; leaves narrowly oblong)
 Lobelia, Lobelia spicata.
 5b. Flowers distinctly pedicelled, in loose racemes —6.

The corolla of each individual flower consists of 5 (or 4 in a few species) united petals. In some flowers the petals are united to form a tubular or bell-shaped corolla with 5 (or 4) terminal lobes. In others they are united into a flat or strap-shaped corolla, frequently with a few teeth or lobes at the end. Looking closely at the white marginal flowers of a daisy, the yellow marginal flowers of a sunflower, or any flower of a dandelion, one sees that the margins of the flat corolla are rolled in and united at the very base.

The stamens, which are not necessarily present in every flower of a head, are attached at their base to the corolla. Their filaments are separate, but their anthers are united into a tube which surrounds

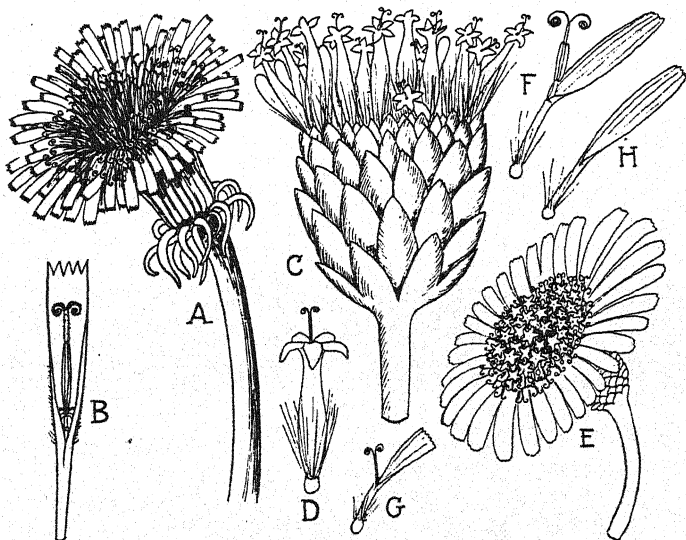


FIG. 32. Flower structure in the Composite Family, illustrating numbers 2a, 2b, and 2c. A. Head of a ligulate composite, with only strap-shaped flowers; B. A single strap-shaped flower; C. Head of a tubular composite, with all tubular flowers; D. A single tubular flower; E. Head of a radiate composite, with tubular flowers in the center (the disk) and radiate flowers (rays) around the margin; F. A perfect ray flower, with both stamens and pistil; G. A pistillate ray flower, with no stamens; H. A neutral or sterile ray flower, with neither pistil nor stamens.

the style. The two-lobed stigma protrudes through the tube of anthers.

A single head of composites, consisting of several or many individual flowers, may be composed entirely of tubular flowers, as the thistle or the boneset; or entirely of strap-shaped flowers, as the dandelion; or of both sorts together, as the daisy, the aster, or the sunflower. In the last case, the tubular flowers always occupy the center of the head, which is called the *disk*, and the larger strap-shaped corollas are at the margin and are called *rays*. The rays and the disk often differ in color. Besides these three common types of composite heads, a few weedy species have minute corollas without colored parts, and in the key below are considered under 1b.

Before attempting to identify a composite, ascertain whether the heads are composed of tubular flowers, of strap-shaped flowers, or of both sorts together; also observe the structure of the pappus, using preferably ripe heads or at least the oldest flower-heads available. No further difficulties should be encountered.

- 1a. Flowers with some petal-like parts, usually brightly colored or white and often large and conspicuous; in some cases the flowers and flower-heads are small, and in others the flowers are almost concealed in woolly heads —2.
- 1b. Flowers without petal-like or brightly colored parts; staminate and pistillate flowers in separate heads (or rarely in the same heads) which scarcely resemble those of ordinary members of the family; coarse weeds with inconspicuous flowers (summer and autumn) (ragweed, cocklebur, and their relatives) —217.
- 2a. Flowers all strap-shaped; juice milky (the central flowers must be examined carefully, since they are often much smaller than the marginal ones) (ligulate composites: dandelion, lettuce, hawkweed, and their relatives) —6.
- 2b. Flowers all tubular, with small, regular or nearly regular, 4-lobed or 5-lobed corollas (discoid composites: ironweed, boneset, thistle, and their relatives) —3.
- 2c. Flowers both tubular and strap-shaped; flower-heads radiate (radiate composites: aster, sunflower, daisy, and their relatives) —5.
- 3a. Leaves or involucre or both spiny or prickly (thistles and their relatives) (summer) —47.

- 3b. Neither leaves nor involucre spiny or prickly —4.
- 4a. Flowers yellow or brownish —61.
- 4b. Flowers white to purple, blue, or red; never yellow —72.
- 5a. Rays yellow to brown —106.
- 5b. Rays white to red, blue, or purple, never yellow, even in part —162.

6. Ligulate Composites

(Dandelion, Lettuce, Hawkweed, etc.)

- 6a. Flowers distinctly blue or purple (summer and autumn) —7.
- 6b. Flowers orange, yellow, white, or nearly red, or intermediate tints, rarely greenish or faintly purplish —9.
- 7a. Flower-heads 25 mm. wide or larger (4–10 dm. high) —8.
- 7b. Flower-heads 15 mm. wide or smaller (1–3 m. high) (Wild Lettuce) —31.
- 8a. Leaves grass-like, linear, entire; flower-heads 5–8 cm. wide, solitary at the end of long stalks
Salsify, *Tragopogon porrifolius*.
- 8b. Leaves more or less toothed or lobed, not grass-like; heads 2.5–4 cm. wide, sessile or nearly so
Chicory, *Cichorium Intybus*.
- 9a. Flower-heads solitary on each stem from the ground, the leaves all or mostly basal —10.
- 9b. Flower-heads 2 or more on each flowering stem, never single at the end of leafless stalks —15.
- 10a. Flower-stalk bearing a single oblong clasping leaf near its middle —15b.
- 10b. Flower-stalk without true leaves, but with 1 or more scale-like bracts —18.
- 10c. Flower-stalk naked, with neither leaves nor bracts —11.
- 11a. Achenes tipped with a slender beak bearing the pappus at its summit; flower-stalk hollow (1–4 dm. high; leaves oblong or linear-oblong, toothed or pinnatifid; heads 25–40 mm. wide, spring and fall) (Dandelion) —12.
- 11b. Achenes not beaked, bearing the pappus at their summit —13.
- 12a. Outer bracts reflexed; seeds olive-brown
Dandelion, *Taraxacum officinale*.
- 12b. Outer bracts spreading or ascending; seeds red-brown
Dandelion, *Taraxacum erythrospermum*.

- 13a. Plants smooth throughout (1-4 dm. high; leaves narrowly oblong, usually pinnatifid; flower-heads 8-12 mm. wide, spring and summer) **Dwarf Dandelion, *Krigia virginica*.**
- 13b. Plants hairy (1-3 dm. high; leaves linear-oblong to lanceolate; late spring and summer) —14.
- 14a. Leaves green beneath (heads about 15 mm. wide)
Hawkbitt, *Leontodon nudicaulis*.
- 14b. Leaves white-woolly beneath (heads 25-30 mm. wide)
Mouse-ear, *Hieracium pilosella*.
- 15a. Pappus none; lower leaves ovate, toothed; upper leaves linear to lanceolate (4-10 dm. high; heads about 10 mm. wide, summer)
Nipple-wort, *Lapsana communis*.
- 15b. Pappus of an inner series of bristles surrounded by an outer series of scales (smooth, 3-6 dm. high; stem-leaves oblong, clasping; heads about 3 cm. wide, late spring and summer)
Dwarf Dandelion, *Krigia amplexicaulis*.
- 15c. Pappus of feathery or branched hairs —16.
- 15d. Pappus of simple unbranched hairs —20.
- 16a. Leaves grass-like, entire (4-8 dm. high; heads 2-5 cm. wide, summer)
Goat's Beard, *Tragopogon pratensis*.
- 16b. Leaves not grass-like, more or less toothed or lobed —17.
- 17a. Stem-leaves reduced to minute scales (2-6 dm. high; basal leaves oblanceolate, toothed or pinnatifid; heads 25-50 mm. wide) —18.
- 17b. Stem-leaves present and not scale-like (3-8 dm. high; summer) (Ox-tongue) —19.
- 18a. Leaves hairy (summer) **Cat's-ear, *Hypochaeris radicata*.**
- 18b. Leaves smooth (summer and fall)
Fall Dandelion, *Leontodon autumnalis*.
- 19a. Outer bracts of the involucre linear; upper leaves nearly linear (heads 15-20 mm. wide) **Ox-tongue, *Picris hieracioides*.**
- 19b. Outer bracts of the involucre ovate, leaf-like; upper leaves oblong, clasping (heads 10-15 mm. wide)
Ox-tongue, *Picris echioides*.
- 20a. Flowers white, cream-color, greenish, or rarely purplish, never a bright yellow or orange; achenes never flattened (late summer and fall) (Rattlesnake-root) —21.
- 20b. Flowers distinctly yellow, orange, or red (in some cases the

flowers are rather pale yellow, but then the achenes are flattened) —26.

21a. Flower-heads all or mostly nodding; involucre smooth or with a few hairs only; principal leaves strongly angled or lobed, often rather triangular in outline —22.

21b. Flower-heads pointing in various directions, in spike-like panicles; involucre hairy; principal leaves lanceolate to oblong, never lobed (5-15 dm. high)

Rattlesnake-root, *Prenanthes racemosa*.

22a. With 5-7 individual flowers in each flower-head (10-15 dm. high)

Rattlesnake-root, *Prenanthes altissima*.

22b. With 8-16 individual flowers in each flower-head (5-15 dm. high) —23.

23a. Pappus dark reddish brown Rattlesnake-root, *Prenanthes alba*.

23b. Pappus pale brown, straw-color, or nearly white —24.

24a. Heads in a branched cluster —25.

24b. Heads nearly sessile, in a simple, erect, unbranched, spike-like cluster, often all on one side

Rattlesnake-root, *Prenanthes virgata*.

25a. The small outermost involucre bracts lanceolate

Rattlesnake-root, *Prenanthes serpentaria*.

25b. The small outermost involucre bracts broadly ovate

Rattlesnake-root, *Prenanthes trifoliolata*.

26a. Achene tipped with a stout or slender beak, bearing the pappus at its summit (heads 1 cm. wide or less, very numerous in a large branched panicle, summer) (Wild Lettuce) —27.

26b. Achenes without a beak, bearing the pappus directly at their summit —24.

27a. Leaves mostly twisted at base to stand in a vertical position, usually prickly on the midvein beneath (5-15 dm. high) —28.

27b. Leaves spreading, flat, not twisted at base —29.

28a. Leaves pinnatifid

Wild Lettuce, *Lactuca scariola*.

28b. Leaves merely toothed

Wild Lettuce, *Lactuca scariola* var. *integrata*.

29a. Leaves hirsute or bristly on the midvein beneath (5-20 dm. high)

Wild Lettuce, *Lactuca hirsuta*.

29b. Leaves smooth beneath (1-3 m. high) —30.

- 30a. Stem-leaves mostly deeply pinnatifid
Wild Lettuce, *Lactuca canadensis*.
- 30b. Stem-leaves entire or sparsely toothed
Wild Lettuce, *Lactuca integrifolia*.
- 31a. Pappus tawny in color; leaves deeply pinnatifid
Wild Lettuce, *Lactuca spicata*.
- 31b. Pappus white or cream-color —32.
- 32a. Principal leaves deeply pinnatifid; achenes distinctly beaked
—33.
- 32b. Principal leaves oblong, merely toothed; achenes nearly beakless
Wild Lettuce, *Lactuca villosa*.
- 33a. Achenes flat, abruptly narrowed at the end and bearing a slender beak; a rare species
Wild Lettuce, *Lactuca Morssii*.
- 33b. Achenes rather thick, gradually tapering at the end into a short stout beak; a common species
Wild Lettuce, *Lactuca floridana*.
- 34a. Pappus white (summer) —35.
- 34b. Pappus yellow, tawny, or brown (summer) (Hawkweed)
—38.
- 35a. Involucre smooth; heads 1 cm. wide —32b.
- 35b. Involucre smooth; heads 2-3 cm. wide (5-15 dm. high; leaves sharply toothed or pinnatifid, slightly prickly on the margin)
(Sow Thistle) —36.
- 35c. Involucre hairy —37.
- 36a. The clasping leaf-bases acute
Sow Thistle, *Sonchus oleraceus*.
- 36b. The clasping leaf-bases rounded
Sow Thistle, *Sonchus asper*.
- 37a. Involucre about 20 mm. long (6-12 dm. high; lower leaves pinnatifid, and sometimes the upper ones also; heads 3-4 cm. wide)
Sow Thistle, *Sonchus arvensis*.
- 37b. Involucre 6-12 mm. long (4-8 dm. high; lower leaves usually pinnatifid, the upper lanceolate)
Hawk's-beard, *Crepis capillaris*.
- 38a. Plants producing creeping stolons from the base and therefore growing in patches; introduced weeds of meadows, roadsides, and pastures; basal leaves oblong or lanceolate; stem-leaves small or none; heads 2-3 cm. wide —39.

- 38b. Plants without creeping stolons, therefore growing scattered;
native plants of woods —41.
- 39a. Flowers orange-red (2-6 dm. high)
Hawkweed or King Devil, Hieracium aurantiacum.
- 39b. Flowers yellow —40.
- 40a. Heads several on each stalk (4-8 dm. high)
Hawkweed or King Devil, Hieracium pratense.
- 40b. Heads 1-3 on each stalk (1-3 dm. high)
Hawkweed or Mouse-ear, Hieracium pilosella.
- 41a. Stems leafy, the stem-leaves nearly as large and fully as conspicuous as the basal ones, oblong to oblanceolate —42.
- 41b. Stems nearly or quite scape-like, the principal leaves in a basal rosette, obovate to oblanceolate, the stem-leaves few and much smaller (heads 1-2 cm. wide) —45.
- 42a. Leaves conspicuously beset with long hairs —43.
- 42b. Leaves smooth or nearly so —44.
- 43a. Leaves minutely hairy beneath —45a.
- 43b. Leaves densely hairy beneath (heads about 15 mm. wide)
Hawkweed, Hieracium scabrum.
- 44a. Flower-heads about 12 mm. wide (3-8 dm. high)
Hawkweed, Hieracium paniculatum.
- 44b. Flower-heads about 25 mm. wide (5-15 dm. high)
Hawkweed, Hieracium canadense.
- 45a. Leaves hairy on the upper side (3-10 dm. high)
Hawkweed, Hieracium Gronovii.
- 45b. Leaves smooth above (4-9 dm. high) —46.
- 46a. Basal leaves conspicuously veined with purple
Hawkweed, Hieracium venosum.
- 46b. Basal leaves not purple-veined
Hawkweed, Hieracium marianum.

47. Discoid Composites

(Thistles and their relatives)

- 47a. Only the involucre with prickles or spines —48.
- 47b. Leaves prickly or spiny, and often the involucre also (Thistle)
—52.
- 48a. Leaves broadly ovate, 1-4 dm. wide, mostly basal (flowers purple-red or rose-purple) (Burdock) —49.
- 48b. Leaves narrowly oblong to oblanceolate, or pinnately lobed,

- 6 cm. wide or less (3-6 dm. high; heads about 25 mm. wide) —50.
- 49a. Flower-heads 1.5-3 cm. wide (5-15 dm. high)
Burdock, *Arctium minus*.
- 49b. Heads 3-5 cm. wide (1-3 m. high) **Burdock, *Arctium Lappa*.**
- 50a. Terminal spine of each bract of the involucre long, straight, and stiff —51.
- 50b. Terminal spine of each bract scarcely any longer or stiffer than the fringe of teeth along the side of the bract (flowers blue, red, or white, or intermediate colors) —36a.
- 51a. Flowers yellow **Barnaby's Thistle, *Centaurea solstitialis*.**
- 51b. Flowers purple or purplish **Star Thistle, *Centaurea Calcitrapa*.**
- 52a. Flowers yellow —53.
- 52b. Flowers rose-purple, varying occasionally to white —54.
- 53a. Bracts of the involucre tipped by spines (4-8 dm. high; upper leaves oblong, clasping; heads 5 cm. wide, sessile among the upper leaves) **Blessed Thistle, *Cnicus benedictus*.**
- 53b. Bracts of the involucre not tipped with spines (5-15 dm. high; upper leaves lanceolate, clasping; heads 4-8 cm. wide)
Yellow Thistle, *Cirsium spinosissimum*.
- 54a. Longest spines on the involucre 2-3 cm. long, spreading (5-10 dm. high; leaves lobed, clasping at base; heads about 5 cm. wide) **Lady's Thistle, *Silybum marianum*.**
- 54b. Spines of the involucre much shorter, rarely as much as 1 cm. long —55.
- 55a. Leaves white-woolly on both sides (1-2 m. high, with winged stems; heads 3-5 cm. wide)
Scotch Thistle, *Onopordum Acanthium*.
- 55b. Leaves green on both sides —56.
- 55c. Leaves green above, woolly and often whitened beneath —59.
- 56a. Leaves decurrent, producing a winged stem; involucre bracts ending in long prickles (1-2 m. high; heads 4-6 cm. wide)
Bull Thistle, *Cirsium lanceolatum*.
- 56b. Leaves sessile but not decurrent on the stem; heads 4-8 cm. wide —57.
- 56c. Heads about 2 cm. wide, usually numerous; involucre bracts prickly at the tip (4-10 dm. high)
Canada Thistle, *Cirsium arvense*.

57a. Heads closely surrounded by several linear spiny leaves; bracts of the involucre not spiny —53b.

57b. Heads all or mostly on stalks, occasionally with 1 or 2 small leaves at their base —58.

58a. Outer bracts of the involucre prickly at the tip (4-10 dm. high) **Pasture Thistle, *Cirsium pumilum*.**

58b. Bracts of the involucre all without prickles (10-25 dm. high) **Swamp Thistle, *Cirsium muticum*.**

59a. Leaves deeply pinnatifid, decurrent, producing a winged stem —56a.

59b. Leaves deeply pinnatifid, not decurrent on the stem —60.

59c. Leaves merely toothed or slightly lobed, not decurrent on the stem (1-3 m. high) **Thistle, *Cirsium altissimum*.**

60a. Only the youngest leaves white beneath, becoming green when mature —58b.

60b. Leaves permanently white beneath **Thistle, *Cirsium discolor*.**

61. Discoid Composites

(Tansy, Wormwood, and their relatives)

61a. Leaves opposite —62.

61b. Leaves alternate, or chiefly basal, or irregularly scattered —63.

62a. Leaves simple and ovate —164b.

62b. Leaves simple and narrowly lanceolate, or deeply dissected, or compound —111.

63a. Stem-leaves entire (the basal ones may rarely be toothed) —64.

63b. Stem-leaves toothed —66.

63c. Leaves once-pinnatifid, with oblong toothed lobes (smooth or sparingly hairy, 2-4 dm. high; heads about 6 mm. wide, spring to fall) **Groundsel, *Senecio vulgaris*.**

63d. Leaves deeply and rather palmately lobed, densely and softly white-woolly beneath (4-8 dm. high; summer) (Wormwood) —67.

63e. Leaves 2-3 times dissected, smooth or sparingly hairy beneath —68.

64a. Leaves smooth, linear (5-15 dm. high, in salt marshes; heads 5-10 mm. wide, late summer)

Salt Marsh Aster, *Aster subulatus*.

- 64b. Leaves hairy, but not white-woolly; ill-smelling weeds —173b.
 64c. Leaves white-woolly beneath —65.
- 65a. Flowering in spring —93a.
 65b. Flowering in summer or autumn —93b.
- 66a. Involucre smooth (1-3 m. high, mostly in salt marshes;
 larger leaves obovate, coarsely toothed; late summer and fall)
Groundsel Tree, Baccharis halimifolia.
- 66b. Involucre very viscid —145b.
- 67a. Leaves all or mostly woolly above; flower-heads 6-8 mm. wide;
 plant of sandy beaches **Wormwood, Artemisia Stelleriana.**
- 67b. Leaves bright green and smooth above; heads about 4 mm.
 wide; plant of roadsides and waste places
Wormwood, Artemisia vulgaris.
- 68a. Heads numerous, 7-10 mm. wide, crowded in flat-topped
 clusters (6-10 dm. high; summer)
Tansy, Tanacetum vulgare.
- 68b. Heads several, 6-8 mm. wide, each at the end of a long stalk
 (2-5 dm. high; late spring and summer)
Pineapple Weed, Matricaria suaveolens.
- 68c. Heads small, 2-5 mm. wide, in spikes, racemes, or panicles
 (late summer and fall) (Wormwood) —69.
- 69a. Leaf-lobes narrowly linear, entire; plant of sea-beaches (7-15
 dm. high) **Wormwood, Artemisia caudata.**
- 69b. Leaf-lobes toothed or incised; weeds of roadsides and waste
 places (4-10 dm. high) —70.
- 70a. Heads in a loose spreading panicle —71.
- 70b. Heads in axillary clusters, producing a leafy, spike-like
 panicle **Wormwood, Artemisia biennis.**
- 71a. Heads 4-5 mm. wide **Wormwood, Artemisia Absinthium.**
- 71b. Heads about 2 mm. wide **Wormwood, Artemisia annua.**

72. Discoid Composites

(Boneset, Ironweed, and their relatives)

- 72a. Leaves deeply and more or less palmately lobed, densely and
 softly white-woolly beneath (4-10 dm. high; summer)
 (Wormwood) —67.
- 72b. Leaves 2-3 times dissected, smooth or sparsely hairy beneath

(late summer and fall) (Wormwood) —69.

72c. Leaves entire or toothed, or with a few very shallow lobes, in which case they are not white-woolly beneath —73.

73a. Leaves opposite or whorled (some of the uppermost, among the branches of the flower-cluster, may be alternate) (summer and early fall) —74.

73b. Leaves alternate, or chiefly basal, or irregularly scattered —86.

74a. Twining vine with heart-shaped leaves (flowers in rounded clusters, pink or white, summer)

Climbing Hempweed, *Mikania scandens*.

74b. Erect or nearly so, not twining (flowers in terminal clusters) —75.

75a. Leaves whorled, usually in fours or sixes (flowers pink, purple, or flesh-colored) —76.

75b. Leaves opposite, although sometimes with smaller leaves clustered in their axils —78.

76a. Leaves linear, entire (2-6 dm. high, in Pine Barren swamps)

Sclerolepis, *Sclerolepis uniflora*.

76b. Leaves oblong to lanceolate, toothed (1-3 m. high) (Joe-Pye Weed) —77.

77a. Inflorescence ovoid or pyramidal

Joe-Pye Weed, *Eupatorium purpureum*.

77b. Inflorescence depressed or flattened

Joe-Pye Weed, *Eupatorium purpureum* var. *maculatum*.

78a. Leaves linear, 1-4 mm. wide, entire, with numerous other leaves of about the same size clustered in their axils (3-6 dm. high)

Thoroughwort, *Eupatorium hyssopifolium*.

78b. Leaves lanceolate, united by their bases around the stem (7-12 dm. high)

Boneset, *Eupatorium perfoliatum*.

78c. Leaves ovate, conspicuously petioled; involueral bracts all about the same length (4-10 dm. high) (White Snake-root) —79.

78d. Leaves linear to ovate, toothed, sessile or on petioles less than 3 mm. long; involueral bracts conspicuously uneven in length (Thoroughwort) —80.

79a. Teeth of the leaves sharp-pointed

White Snakeroot, *Eupatorium urticaefolium*.

79b. Teeth of the leaves blunt

White Snakeroot, *Eupatorium aromaticum*.

80a. Leaves palmately veined, broadly ovate to ovate-oblong, the 3 strongest veins arising at or near the rounded base —81.

80b. Leaves pinnately veined, with a single principal midvein from the base —83.

81a. Well-grown leaves with 5-12 (usually 7-10) teeth on each side; leaves triangular-ovate to oblong-ovate (1-2 m. high)

Thoroughwort, *Eupatorium verbenaeifolium*.

81b. Well-grown leaves with 13-30 (usually about 20) teeth on each side —82.

82a. Leaves acute; leaf-teeth sharp (7-15 dm. high)

Thoroughwort, *Eupatorium pubescens*.

82b. Leaves obtuse, their teeth more or less rounded (3-8 dm. high)

Thoroughwort, *Eupatorium rotundifolium*.

83a. Ordinary well-grown leaves 15-30 mm. wide —84.

83b. Ordinary well-grown leaves 5-12 mm. wide (3-8 dm. high) —85.

84a. Leaves broadest near the rounded base, and thence tapering to the apex, with 1 midvein; stem smooth (5-15 dm. high)

Thoroughwort, *Eupatorium sessilifolium*.

84b. Leaves narrowed at the base, broadest near the middle, the midvein usually emitting at about a third of its length 2 lateral veins which are stronger than the rest; stem rough (3-10 dm. high)

Thoroughwort, *Eupatorium album*.

85a. Involucral bracts acuminate

Thoroughwort, *Eupatorium leucolepis*.

85b. Involucral bracts obtuse or rounded at the tip

Thoroughwort, *Eupatorium resinosum*.

86a. Involucral bracts tipped with a broad fringed appendage, or deeply toothed (3-8 dm. high; summer) —87.

86b. Involucral bracts without a fringed appendage and not deeply toothed —88.

87a. Principal leaves strictly entire

Corn-flower, *Centaurea Cyanus*.

87b. Principal leaves deeply pinnatifid

Knapweed, *Centaurea maculosa*.

87c. Principal leaves merely irregularly toothed

Knapweed, *Centaurea nigra*.

88a. Flowers purple, rose-purple, or pale purple —89.

88b. Flowers white or cream-color —93.

- 89a. Leaves linear, entire; flowers in terminal spikes or racemes (Blazing Star) —90.
- 89b. Leaves lanceolate to ovate, toothed; flowers not in spikes or racemes —92.
- 90a. Flower-heads 2-3 cm. wide, each containing 25-40 individual flowers (5-15 dm. high) **Blazing Star, *Liatris scariosa*.**
- 90b. Flower-heads smaller, each containing 6-12 individual flowers —91.
- 91a. Heads all or mostly sessile (5-15 dm. high) **Blazing Star, *Liatris spicata*.**
- 91b. Heads all or mostly on short pedicels (4-9 dm. high) **Blazing Star, *Liatris graminifolia*.**
- 92a. Involucral bracts tipped with a narrow linear appendage (6-15 dm. high; leaves lanceolate; heads about 1 cm. wide, in flat-topped clusters) **Ironweed, *Vernonia noveboracensis*.**
- 92b. Involucral bracts not appendaged (6-10 dm. high; leaves oblong, sessile; salt-marsh plant with pale purple flowers) **Marsh Fleabane, *Pluchea camphorata*.**
- 93a. Flowering in spring; low plants 1-4 dm. high, with a basal rosette of broad leaves, the stem-leaves very much smaller; stem and foliage more or less white-woolly (flower-heads small, in dense terminal clusters) (Everlasting) —94.
- 93b. Flowering in summer and fall, with well developed stem-leaves —99.
- 94a. Stolons from the basal rosette of leaves leafy throughout their length and ascending at the tip —95.
- 94b. Stolons prostrate throughout their length and leafy only at the tip **Everlasting, *Antennaria neglecta*.**
- 95a. Leaves of the basal rosette 2-5 cm. long, with 1 principal mid-vein —96.
- 95b. Leaves of the basal rosette 5-10 cm. long, with 3 principal veins —97.
- 96a. Basal leaves spatulate or oblanceolate, smooth above **Everlasting, *Antennaria canadensis*.**
- 96b. Basal leaves obovate, hairy above **Everlasting, *Antennaria neodioica*.**
- 97a. Basal leaves smooth above **Everlasting, *Antennaria Parlinii*.**
- 97b. Basal leaves dull green and hairy above —98.

- 98a. Heads 6-8 mm. high; styles crimson
Everlasting, *Antennaria plantaginifolia*.
- 98b. Heads 8-11 mm. high; styles pinkish
Everlasting, *Antennaria fallax*.
- 99a. Leaves nearly or quite entire, linear or narrowly spatulate,
white-woolly beneath —100.
- 99b. Leaves toothed or lobed, smooth or minutely hairy beneath —103.
- 100a. Erect, 4-9 dm. high; involucre bracts pearly white
Pearly Everlasting, *Anaphalis margaritacea*.
- 100b. Erect, 4-8 dm. high; involucre bracts dull white, pale brown,
or purplish (Cudweed) —101.
- 100c. Diffusely branched, 1-2 dm. high; involucre bracts brown;
heads in dense clusters Cudweed, *Gnaphalium uliginosum*.
- 101a. Flower-heads in elongate spike-like clusters
Cudweed, *Gnaphalium purpureum*.
- 101b. Flower-heads in rounded or flattened clusters —102.
- 102a. Leaves decurrent on the stem
Cudweed, *Gnaphalium decurrens*.
- 102b. Leaves not decurrent on the stem
Cudweed, *Gnaphalium polycephalum*.
- 103a. Shrub of salt-marshes, 1-3 m. high —66a.
- 103b. Herbaceous plants of dry or moist ground —104.
- 104a. Leaves triangular, hastate, or somewhat 3-lobed, toothed
(10-15 dm. high; flower-heads about 5 mm. wide, in a
flattish cluster) Indian Plantain, *Cacalia suaveolens*.
- 104b. Leaves linear-lanceolate to ovate-lanceolate —105.
- 105a. Involucre about 8 mm. long; flower-heads with 10-25 individual
flowers False Boneset, *Kuhnia eupatorioides*.
- 105b. Involucre 12-18 mm. long, swollen at the base; heads with 50
individual flowers or more
Fireweed, *Erechtites hieracifolia*.

106. Radiate Composites

(Goldenrod, Sunflower, and their relatives)

- 106a. Foliage leaves none at flowering time, the flower-heads soli-
tary at the end of a scaly stalk, about 25 mm. wide (1-4
dm. high; leaves basal, heart-shaped; spring)
Coltsfoot, *Tussilago Farfara*.

- 106b. Leaves present on the stem, opposite —107.
- 106c. Leaves present on the stem, alternate, or with smaller ones clustered in their axils —118.
- 107a. Ray-flowers pistillate, the 2-lobed style protruding from their base and plainly visible without a magnifying glass (summer) —108.
- 107b. Ray-flowers with neither stamens nor pistil —110.
- 108a. Leaves united at base into a cup surrounding the stem, broadly ovate, coarsely toothed (1-3 m. high; heads 6-8 cm. wide)
Cup Plant, *Silphium perfoliatum*.
- 108b. Leaves rounded and petioled at base, not united, ovate (7-15 dm. high; heads about 6 cm. wide) (Ox-eye) —109.
- 109a. Leaves smooth **Ox-eye, *Heliopsis helianthoides*.**
- 109b. Leaves rough **Ox-eye, *Heliopsis scabra*.**
- 110a. Bracts of the involucre in 2 distinct sets, conspicuously differing in form or texture or both (late summer and fall) —111.
- 110b. Bracts of the involucre nearly or quite alike in form, texture, and color, differing only in size (summer and fall) (Sunflower) —154.
- 111a. Aquatic plant with finely dissected submerged leaves and lanceolate emersed leaves (heads 3-4 cm. wide, with 6-10 rays)
Water Marigold, *Bidens Beckii*.
- 111b. Terrestrial or swamp plants with simple, lanceolate, toothed leaves; rays either present or none (Bur Marigold) —112.
- 111c. Terrestrial or swamp plants with compound or dissected leaves; rays either present or none —115.
- 112a. Rays large and conspicuous, 2-3 cm. long (3-10 dm. high)
Bur Marigold, *Bidens laevis*.
- 112b. Rays 1 cm. long or shorter, or none (2-15 dm. high) —113.
- 113a. Outer involucral bracts leaf-like, 3-8 cm. long; rays none
Bur Marigold, *Bidens comosa*.
- 113b. Outer involucral bracts 1-2.5 cm. long —114.
- 114a. Heads nodding after flowering; short rays usually present
Bur Marigold, *Bidens cernua*.
- 114b. Heads permanently erect; rays usually none
Bur Marigold, *Bidens connata*.
- 115a. Rays conspicuous, 15-25 mm. long (7-15 dm. high)
Tickseed Sunflower, *Bidens trichosperma*.

in spikes, racemes, flattened or rounded clusters, or panicles (Goldenrod) —119.

- 118b. Heads medium-sized or large, almost always more than 2 cm. in width, including the rays. A few species which bloom in the spring have smaller heads, and there are two in the summer, distinguished from the goldenrods by the few heads —142.
- 119a. Heads chiefly in clusters or short racemes in the axils of ordinary foliage leaves, or occasionally the upper crowded into a leafy cluster terminating the stem (4-10 dm. high) —120.
- 119b. Heads chiefly in erect, compact, terminal clusters, the individual racemes or branches of the cluster either short and arranged along a more or less elongated central axis, or elongated and ascending, scarcely recurved, forming a narrow panicle, never in one-sided clusters —121.
- 119c. Heads produced on one side only of a more or less elongated, spreading, usually recurved branch, all the branches together forming a terminal widened panicle —127.
- 119d. Heads crowded at or near the ends of the branches at about the same distance from the base of the panicle, forming a rounded or flat-topped inflorescence —140.
- 120a. Leaves ovate, abruptly narrowed at base into a winged petiole Goldenrod, *Solidago latifolia*.
- 120b. Leaves oblong-lanceolate, sessile or nearly so Goldenrod, *Solidago caesia*.
- 121a. Bracts of the involucre recurved or widely spreading (5-15 dm. high; leaves oblong) Goldenrod, *Solidago squarrosa*.
- 121b. Bracts of the involucre closely appressed —122.
- 122a. Stems hairy (3-10 dm. high) —123.
- 122b. Stems smooth —124.
- 123a. Rays yellow (leaves lanceolate) Goldenrod, *Solidago puberula*.
- 123b. Rays white (leaves oblong to obovate) Goldenrod, *Solidago bicolor*.
- 124a. Principal stem-leaves broadly oval, nearly or quite half as wide as long and usually more than 25 mm. wide (5-20 dm. high) Goldenrod, *Solidago speciosa*.
- 124b. Principal stem-leaves narrowly oblong or lanceolate, generally less than a third as wide as long and seldom more than 15 mm. wide —125.

- 125a. Plant of swamps or bogs, northern New Jersey and northward
(4-10 dm. high) **Goldenrod, Solidago uliginosa.**
- 125b. Plants of dry soil or pine barrens, Long Island and south-
ward —126.
- 126a. Uppermost leaves erect or appressed to the stem, mostly only
1-2 cm. long (5-15 dm. high) **Goldenrod, Solidago stricta.**
- 126b. Uppermost leaves spreading or ascending, usually 2-4 cm.
long (5-8 dm. high) **Goldenrod, Solidago erecta.**
- 127a. Plant of salt-marshes and sea-beaches, with thick, fleshy, entire
leaves (5-20 dm. high) **Goldenrod, Solidago sempervirens.**
- 127b. Plants of inland swamps and marshes, the toothed leaves smooth
below but very rough above; stems 4-angled (5-20 dm. high)
Goldenrod, Solidago patula.
- 127c. Plants of various inland situations, the leaves smooth or hairy,
but never very rough above —128.
- 128a. Leaves all entire and 1-nerved, narrowly lanceolate (5-10 dm.
high) **Goldenrod, Solidago odora.**
- 128b. At least the principal leaves toothed, with visible lateral
veins —129.
- 129a. Stems below the flower-cluster distinctly hairy —130.
- 129b. Stems below the flower-cluster smooth —134.
- 130a. Leaves oblanceolate or spatulate, bluntly toothed, the stem-
leaves much smaller than the basal; stems rarely more than
6 dm. high; whole plant covered with fine gray hairs
Goldenrod, Solidago nemoralis.
- 130b. Leaves lanceolate to oblong; stems rarely less than 6 dm.
high —131.
- 131a. Leaves pinnately veined, with 1 principal midvein —132.
- 131b. Leaves with 3 principal longitudinal veins —133.
- 132a. Leaves sharply toothed, narrowed to the base
Goldenrod, Solidago rugosa.
- 132b. Leaves very sparsely toothed or entire, with a very broad
rounded base **Goldenrod, Solidago fistulosa.**
- 133a. Involucre 2-3 mm. long **Goldenrod, Solidago canadensis.**
- 133b. Involucre 3-5 mm. long **Goldenrod, Solidago altissima.**
- 134a. Leaves 3-nerved, lanceolate or narrowly oblong-lanceolate
(1-2 m. high) **Goldenrod, Solidago serotina.**
- 134b. Leaves pinnately veined with 1 midvein (5-15 dm. high)
—135.

- 135a. Leaves essentially uniform in size from the base to the summit of the stem —136.
- 135b. Basal leaves much larger than the greatly reduced or bract-like upper ones —137.
- 136a. Leaves oblong-lanceolate to narrowly elliptical, sessile
Goldenrod, *Solidago Elliottii*.
- 136b. Leaves elliptical-ovate to broadly oblong-lanceolate, tapering to a petiole-like base Goldenrod, *Solidago ulmifolia*.
- 137a. Lower leaf-blades broadly ovate Goldenrod, *Solidago arguta*.
- 137b. Lower leaf-blades lanceolate to narrowly ovate-lanceolate —138.
- 138a. Flower-cluster mostly higher than wide; plants growing usually in wet or moist ground —139.
- 138b. Flower-cluster mostly wider than high; plant growing usually in dry ground Goldenrod, *Solidago juncea*.
- 139a. Lower leaves 3-8 cm. wide Goldenrod, *Solidago neglecta*.
- 139b. Lower leaves 1-3 cm. wide Goldenrod, *Solidago uniligulata*.
- 140a. Lower leaves ovate, oblong, or oval, pinnately veined (5-15 dm. high) Goldenrod, *Solidago rigida*.
- 140b. Lower leaves narrowly linear-lanceolate or linear, 1-5-ribbed (3-10 dm. high) —141.
- 141a. Leaves 3-5-ribbed, 4-8 mm. wide
Goldenrod, *Solidago graminifolia*.
- 141b. Leaves 1-3-ribbed, 2-4 mm. wide
Goldenrod, *Solidago tenuifolia*.
- 141c. Leaves 1-ribbed, less than 2 mm. wide
Goldenrod, *Solidago minor*.
- 142a. Ray-flowers pistillate, the 2-lobed style protruding from their base and plainly visible without a magnifying glass —143.
- 142b. Ray-flowers with neither stamens nor pistil —149.
- 143a. Leaves entire (summer) (Golden Aster) —144.
- 143b. Leaves toothed —145.
- 144a. Leaves linear (1-3 dm. high; heads about 1 cm. wide)
Golden Aster, *Chrysopsis falcata*.
- 144b. Leaves oblong or lanceolate (3-8 dm. high; heads about 2 cm. wide)
Golden Aster, *Chrysopsis mariana*.
- 145a. Flower-heads 1-2 cm. wide, in spring and early summer (2-8 dm. high) —146.
- 145b. Heads 2-3 cm. wide, in summer; involucre very viscid; leaves

oblong, sharply toothed, 2-4 cm. long (3-6 dm. high)

Gum Plant, *Grindelia squarrosa*.

145c. Heads 2.5-5 cm. wide, in late summer; principal leaves lanceolate, 8-12 cm. long, decurrent on the stem (5-15 dm. high)

Sneezeweed, *Helenium autumnale*.

145d. Heads 5-8 cm. wide, in summer; principal leaves more than 20 cm. wide, ovate-oblong (6-15 dm. high)

Elecampane, *Inula Helenium*.

146a. Basal leaves with heart-shaped bases

Golden Ragwort, *Senecio aureus*.

146b. Basal leaves narrowed at their bases, not heart-shaped —147.

147a. Stem and leaves gray-woolly

Golden Ragwort, *Senecio tomentosus*.

147b. Stem and leaves smooth, or with a little wool around the bases of the leaves —148.

148a. Basal leaves obovate **Golden Ragwort, *Senecio obovatus*.**

148b. Basal leaves oblong **Golden Ragwort, *Senecio Balsamitae*.**

149a. Disk of the flower-heads hemispherical or conic or short-cylindrical (summer) —150.

149b. Disk flat or slightly convex (summer and fall) (Sunflower) —154.

150a. Disk yellow or greenish yellow (1-3 m. high) —151.

150b. Disk gray-brown to purple or brown (5-15 dm. high) —152.

151a. Principal stem-leaves deeply pinnately divided; heads 6-10 cm. wide

Golden Glow, *Rudbeckia laciniata*.

151b. Principal stem-leaves merely toothed, lanceolate; stem usually winged; heads 2.4-4 cm. wide

Yellow Ironweed, *Actinomeris alternifolia*.

152a. Leaves deeply pinnately divided into several parts; rays drooping, 5-7 cm. long

Gray-headed Coneflower, *Lepachys pinnata*.

152b. Leaves deeply 3-lobed; heads 4-5 cm. wide

Coneflower, *Rudbeckia triloba*.

152c. Stem-leaves entire or merely toothed —153.

153a. Stem hirsute or hispid, not winged; heads 6-10 cm. wide

Black-eyed Susan, *Rudbeckia hirta*.

153b. Stems smooth or slightly hairy, narrowly winged; heads 3-5 cm. wide

Sneezeweed, *Helenium nudiflorum*.

- 154a. Disk-flowers brown or purple; leaves mostly alternate —155.
 154b. Disk-flowers yellow or yellowish —157.
 155a. Leaves linear (6–15 dm. high; heads 5–8 cm. wide)
 Sunflower, *Helianthus angustifolius*.
 155b. Leaves ovate —156.
 156a. Heads 10–20 cm. wide (1–2 m. high)
 Sunflower, *Helianthus annuus*.
 156b. Heads 4–8 cm. wide (4–10 dm. high)
 Sunflower, *Helianthus petiolaris*.
 157a. Principal stem-leaves mostly lanceolate and with only 1 principal
 midvein (5–30 dm. high; heads 5–8 cm. wide) —158.
 157b. Principal leaves ovate or ovate-lanceolate, more or less plainly
 3-nerved from near the base —159.
 158a. Stems smooth **Sunflower, *Helianthus grosseserratus*.**
 158b. Stems hairy or rough **Sunflower, *Helianthus giganteus*.**
 159a. Leaves sessile or nearly so, rounded or somewhat heart-shaped
 at base **Sunflower, *Helianthus divaricatus*.**
 159b. Leaves petioled, acute at base —160.
 160a. Involucral bracts little if any longer than the disk, mostly
 shorter and all tending to be closely appressed
 Sunflower, *Helianthus tuberosus*.
 160b. Involucral bracts, or many of them, conspicuously longer than
 the disk, the outer ones loosely spreading —161.
 161a. Leaves of an ovate type, sharply toothed, the broadest part
 located more than a third of the distance from the base of
 the petiole to the end of the leaf
 Sunflower, *Helianthus decapetalus*.
 161b. Leaves of a lanceolate type, obscurely toothed to entire, the
 broadest part located about a fourth of the distance from the
 base of the petiole to the end of the leaf
 Sunflower, *Helianthus strumosus*.

162. Radiate Composites

(Fleabane, Aster, and their relatives)

- 162a. Leaves opposite (2–6 dm. high) —163.
 162b. Leaves alternate —165.
 162c. Leaves all basal, obovate (5–20 cm. high; heads about 2 cm.
 wide, pink, purple, or white, spring and summer)
 Garden Daisy, *Bellis perennis*.

- 163a. Rays rose-color (leaves linear; heads about 2 cm. wide, summer)
Tickseed, *Coreopsis rosea*.
- 163b. Rays white, small (summer and fall) —164.
- 164a. Leaves oblong-lanceolate, sessile; heads 8-12 mm. wide
Eclipta, *Eclipta alba*.
- 164b. Leaves ovate, petioled; heads about 5 mm. wide
Galinsoga, *Galinsoga parviflora*.
- 165a. Leaves entire or merely toothed —171.
- 165b. Leaves once-pinnatifid, that is, cut rather deeply from the sides toward the midvein, but the resulting divisions not again deeply cut (3-8 dm. high; late spring and summer) —175b.
- 165c. Leaves twice or more pinnatifid, the lateral divisions of the leaf lobed or cut almost to their center (3-8 dm. high; summer) —166.
- 166a. Heads 4-6 mm. wide, crowded in a flat-topped cluster; rays about 5, white
Yarrow, *Achillea Millefolium*.
- 166b. Heads 12 mm. wide or larger, mostly solitary at the end of long stalks; rays 12-25, white —167.
- 167a. Ultimate divisions of the leaf much broader than linear
Feverfew, *Chrysanthemum Parthenium*.
- 167b. Ultimate divisions of the leaf narrowly linear. Four species of plants belong here, which are distinguished with difficulty. The commonest is the Mayweed, 169a. Cut a flower-head lengthwise through the center and look carefully at the base of the individual flowers, particularly those toward the center of the head. Ascertain whether there is a small scale, called chaff, below all or some of the flowers. —168.
- 168a. Chaff present —169.
- 168b. Chaff none —170.
- 169a. Plant very ill-scented when crushed; chaff only below the central flowers in each head; rays mostly 6-8 mm. long
Mayweed, *Anthemis Cotula*.
- 169b. Plant not ill-scented; chaff present below all the disk-flowers; rays mostly 8-12 mm. long
Chamomile, *Anthemis arvensis*.
- 170a. Heads 3-4 cm. wide
Chamomile, *Matricaria inodora*.
- 170b. Heads about 2 cm. wide
Chamomile, *Matricaria Chamomilla*.
- 171a. Heads 3-6 mm. wide, including the rays —172.
- 171b. Heads 8 mm. wide or larger, including the rays —174.

- 172a. Rays purplish; freely branched plant of salt-marshes (5-15 dm. high; leaves linear-lanceolate; late summer and fall)
Aster, *Aster subulatus*.
- 172b. Rays white; erect slender plants of dry or moist soil —173.
- 173a. Leaves obovate to oblong; flower-heads in a narrow erect cluster
Goldenrod, *Solidago bicolor*.
- 173b. Leaves linear or narrowly lanceolate (8-20 dm. high, ill-scented; heads in a spreading cluster, summer and fall)
Horseweed, *Erigeron canadensis*.
- 174a. Pappus none (3-8 dm. high; rays white) —175.
- 174b. Pappus of fine hairs, plainly visible in the ripe heads or at the base of the individual flowers —176.
- 175a. Rays broadly obovate; leaves nearly linear; heads 1-2 cm. wide (summer)
Sneezeweed, *Achillea Ptarmica*.
- 175b. Rays oblong or narrowly elliptical; stem-leaves linear to narrowly oblong; heads 3-5 cm. wide
Daisy, *Chrysanthemum Leucanthemum*.
- 176a. Rays only 4 or 5, white (3-8 dm. high; heads about 2 cm. wide, summer) (White-topped Aster) —177.
- 176b. Rays more numerous —178.
- 177a. Leaves entire, 1-nerved, linear or linear-spatulate
White-topped Aster, *Sericocarpus linifolius*.
- 177b. Leaves more or less toothed, obovate or broadly spatulate
White-topped Aster, *Sericocarpus asteroides*.
- 178a. Involucral bracts all the same length or nearly so and narrow, or with a few short outer ones; plants blooming in spring and early summer, or with a few plants persisting in bloom till autumn (Fleabane) —179.
- 178b. Involucral bracts unequal, the outer successively shorter (or rarely nearly equal), loosely or closely overlapping; plants 3-15 dm. high, blooming in late summer and autumn (Aster) —182.
- 179a. Stem unbranched, except for the flower-stalks; leaves chiefly basal; heads 1-9 (2-5 dm. high; stem-leaves oblong-lanceolate; heads 25-40 mm. wide; rays pale purple, spring)
Fleabane, *Erigeron pulchellus*.
- 179b. Stem branched; principal leaves on the stem; heads usually numerous (3-12 dm. high) —180.

- 180a. Stem-leaves linear, entire (heads 10-15 mm. wide; rays white, summer) **Fleabane, *Erigeron ramosus*.**
- 180b. Stem-leaves ovate-lanceolate, the principal ones toothed —181.
- 181a. Rays 100 or more, light purple or pink; heads 15-25 mm. wide (spring and early summer) **Fleabane, *Erigeron philadelphicus*.**
- 181b. Rays much fewer, white; heads 10-15 mm. wide **Fleabane, *Erigeron annuus*.**
182. Aster. Our numerous species of Aster, so abundant and so decorative in late summer and autumn, are notoriously difficult to identify. Many species are exceedingly variable, depending on the amount of shade, the water-supply, and the character of the soil. Hybrids probably are produced between many species, and tend to mingle the characters of both parents. Roadside Asters, after being cut down in the summer, often send up blooming stems later which are quite abnormal in appearance. Reference to a Manual is strongly recommended, but even our best Manuals are sometimes wrong in their interpretation of this difficult group.
- 182a. Basal leaves petioled and heart-shaped at the base —183.
- 182b. Basal leaves not both petioled and heart-shaped at base; stem-leaves sessile, with heart-shaped or eared bases clasping the stem —189.
- 182c. Basal and stem-leaves either sessile or petioled, but neither with heart-shaped or clasping bases —193.
- 183a. Rays white —184.
- 183b. Rays blue or violet —186.
- 184a. Plant glandular, especially on the pedicels and branches of the flower-cluster **Aster, *Aster macrophyllus*.**
- 184b. Plant not glandular —185.
- 185a. Leaves rough above **Aster, *Aster Schreberi*.**
- 185b. Leaves smooth or slightly hairy above **Aster, *Aster divaricatus*.**
- 186a. Stem-leaves clasping the stem by a heart-shaped base **Aster, *Aster undulatus*.**
- 186b. Stem-leaves not clasping by a heart-shaped base —187.
- 187a. Involucre 4-6 mm. long —188.
- 187b. Involucre 6-10 mm. long **Aster, *Aster sagittifolius*.**
- 188a. Leaves somewhat rough above; petioles not winged **Aster, *Aster cordifolius*.**

- 188b. Leaves smooth above; petioles slender, winged
Aster, Aster Lowrieanus.
- 189a. Stem smooth or nearly so —190.
- 189b. Stem hairy or rough —191.
- 190a. Involucre bell-shaped; foliage pale and glaucous; leaves usually acute, from a broad base (rays light blue)
Aster, Aster laevis.
- 190b. Involucre hemispherical; foliage not glaucous; leaves usually sharply acuminate, from a narrow base (rays light blue to white)
Aster, Aster novi-belgii.
- 191a. Leaves conspicuously toothed (rays blue to white)
Aster, Aster puniceus.
- 191b. Leaves all entire or nearly so —192.
- 192a. Involucre very glandular and viscid; rays very numerous, violet-purple; leaves lanceolate Aster, Aster novae-angliae.
- 192b. Involucre slightly glandular or not at all; rays 20-30, generally blue-purple; leaves ovate-oblong Aster, Aster patens.
- 193a. Leaves silvery-silky on both sides (rays violet-purple)
Aster, Aster concolor.
- 193b. Leaves smooth or somewhat hairy, but not silvery-silky —194.
- 194a. Basal leaves petioled —195.
- 194b. Basal leaves not definitely petioled —197.
- 195a. Involucre glandular-viscid (rays violet)
Aster, Aster spectabilis.
- 195b. Involucre not glandular —196.
- 196a. Leaves finely toothed Aster, Aster radula.
- 196b. Leaves entire Aster, Aster gracilis.
- 197a. Involucral bracts ciliate or bristly —198.
- 197b. Involucral bracts with definitely awl-shaped, rather stiff tips —199.
- 197c. Involucral bracts flat at the tip, not ciliate or bristly —200.
- 198a. Rays white Aster, Aster multiflorus.
- 198b. Rays blue Aster, Aster amethystinus.
- 199a. Heads 8-12 mm. wide, including the rays
Aster, Aster ericoides.
- 199b. Heads 15-20 mm. wide, including the rays
Aster, Aster polyphyllus.
- 200a. Leaves narrowly linear, entire, 1-nerved, not more than 4 cm. long —201.

- 200b. Leaves either not linear, or linear and more than 4 cm. long
—202.
- 201a. Stem smooth; heads 10–15 mm. wide Aster, *Aster dumosus*.
- 201b. Stem hairy or rough; heads about 25 mm. wide
Aster, *Aster linariifolius*.
- 202a. Flower-heads very numerous, in flat-topped clusters; leaves lanceolate; rays white Aster, *Aster umbellatus*.
- 202b. Flower-heads very numerous, in one-sided clusters, each at the end of a very short, minutely leafy branchlet —203.
- 202c. Flower-heads few or many, but not in one-sided or conspicuously flat-topped clusters —204.
- 203a. Stem-leaves linear-lanceolate to linear, nearly or quite entire, stem smooth or minutely hairy; rays white
Aster, *Aster vimineus*.
- 203b. Stem-leaves oblong to lanceolate, sharply toothed along the middle of each side; stems mostly hairy; rays white to pale purple Aster, *Aster lateriflorus*.
- 204a. Salt-marsh plants with linear, fleshy, entire leaves —205.
- 204b. Inland plants, the leaves thin and often toothed —206.
- 205a. Heads 15–20 mm. wide; involucre about 8 mm. long; rays pale purple Aster, *Aster tenuifolius*.
- 205b. Heads 6–10 mm. wide, the involucre 5–6 mm. long, rays purplish or sometimes none Aster, *Aster subulatus*.
- 206a. Flower-heads, including the rays, a full inch wide or more —207.
- 206b. Flower-heads less than an inch wide —212.
- 207a. Leaves toothed in the upper half; rays white or purplish —208.
- 207b. Leaves entire or very finely toothed —209.
- 208a. Principal leaves with several projecting teeth on each side, 15–30 mm. wide Aster, *Aster acuminatus*.
- 208b. Principal leaves not more than 15 mm. wide, with 2 or 3 low teeth on each side Aster, *Aster nemoralis* var. *Blakei*.
- 209a. Leaves narrowly oblong to linear-lanceolate —210.
- 209b. Leaves, or some of them, ovate or obovate; rays white
Aster, *Aster infirmus*.
- 210a. Rays violet to pink —211.
- 210b. Rays white Aster, *Aster polyphyllus*.
- 211a. Principal stem-leaves 8–15 cm. long Aster, *Aster novi-belgii*.
- 211b. Principal stem-leaves 2–6 cm. long Aster, *Aster nemoralis*.

- 212a. Heads solitary at the ends of slender branches 1-5 cm. long, beset with numerous minute leaves 2-4 mm. long; leaves linear; rays pale blue *Aster, Aster dumosus.*
- 212b. Heads in panicles or irregular clusters, the individual heads not on long slender leafy stalks —213.
- 213a. Heads 10-15 mm. wide, including the white or purplish rays *Aster, Aster Tradescanti.*
- 213b. Heads 15-24 mm. wide, including the rays —214.
- 214a. Rays ordinarily white, sometimes faintly tinged with violet —215.
- 214b. Rays violet —216.
- 215a. Leaves toothed *Aster, Aster paniculatus.*
- 215b. Leaves entire *Aster, Aster polyphyllus.*
- 216a. Bracts more or less spreading at the tip *Aster, Aster novi-belgii.*
- 216b. Bracts all erect *Aster, Aster salicifolius.*

217. Ambrosioid Composites

(Ragweed, Cocklebur, and their relatives)

- 217a. Leaves finely dissected; ill-smelling plants 4-10 dm. high; staminate flowers in erect terminal spikes *Ragweed, Ambrosia artemisiifolia.*
- 217b. Leaves deeply 3-lobed; rough-hairy weeds 1-2 m. high; staminate flowers in erect terminal spikes *Giant Ragweed, Ambrosia trifida.*
- 217c. Leaves toothed or shallowly lobed —218.
- 218a. Leaves much longer than broad, narrowed to the base —219.
- 218b. Leaves nearly or quite as broad as long, with a broad base; pistillate flowers and fruits concealed within a spiny bur (3-10 dm. high) (Cocklebur) —220.
- 219a. Leaves smooth beneath, without spines; salt-marsh plants 1-4 m. high *Marsh Elder, Iva oraria.*
- 219b. Leaves rough-hairy, green beneath, without spines; tall slender weeds *Giant Ragweed, Ambrosia trifida var. integrifolia.*
- 219c. Leaves white-downy beneath, with long spines at their base; fruit a spiny bur (4-10 dm. high) *Cocklebur, Xanthium spinosum.*
- 220a. Plant of sandy seashores *Cocklebur, Xanthium echinatum.*
- 220b. Plants of cultivated fields and waste places —221.

- 221a. The 2 longer spines at the tip of the fruiting bur straight;
body of the bur smooth or nearly so
Cocklebur, *Xanthium canadense*.
- 221b. The 2 longer spines at the tip of the bur hooked at the end;
body of the bur densely hairy
Cocklebur, *Xanthium commune*.

Index

Abutilon	96	Amaranthaceae	51
Acalypha	89	Amaranthus	51, 52
Acer	93	Amaryllidaceae	32
Aceraceae	92	Amaryllis Family	32
Acerates	118	Ambrosia	175
Achillea	170, 171	Amelanchier	75
Acnida	52	Amianthum	32
Acorus	23	Ammophila	15
Actaea	61	Amorpha	78
Actinomeris	168	Amphicarpa	79, 80
Adder's Mouth	34	Anacardiaceae	91
Adder's Tongue	4	Anagallis	114
Adiantum	5	Anaphalis	162
Adlumia	63	Andromeda	112
Agastache	129	Andropogon	15
Agrimonia	76, 77	Anemone	60
Agrimony	76, 77	" Rue	61
Agropyron	16	" Wood	60
Agrostemma	55	Anemoneella	61
Agrostis	18	Angelica	108
Ailanthus	88	Antennaria	161, 162
Aizoaceae	53	Anthemis	170
Ajuga	130, 131	Anthoxanthum	15
Alder, Black	92	Antirrhinum	137
" European	41	Anychia	52, 53
" Smooth	41	Apios	79
" Speckled	41	Aplectrum	34
Alettris	31	Apocynaceae	117
Alfalfa	80	Apocynum	117
Alisma	11	Appalachian Cherry	74
Alismaceae	11	Apple	75
Alliaria	68	Apple-of-Peru	133
Allium	29, 30	Aquifoliaceae	91
Alnus	41	Aquilegia	57
Alopecurus	15	Arabis	68
Alsike Clover	81	Araceae	23
Althaea	95	Aralia	105
Alum Root	71	Araliaceae	104
Alyssum	64	Arbor Vitae	9
" Hoary	67	Arbutus, Trailing	110
" Yellow	64	Arctium	156
Amaranth	51	Arctostaphylos	110
" Family	51	Arenaria	54
" Thorny	52	Arethusa	34

Arisaema	23	Barberry	62
Aristolochia	45	" Family	62
Aristolochiaceae	45	Barnaby's Thistle	156
Arrow Arum	23	Barnyard Grass	17
" Grass	11	Bartonia	116
" Grass Family	11	Basil, Wild	127
" -head	11, 13	Basswood	95
" Wood	145	Bayberry	39
Artemisia	158	Beach Grass	15
Arum, Arrow	23	" Pea	79
" Water	23	" Plum	74
" Family	23	Beak Rush	22
Asarum	45	Beaked Hazel	41
Asclepiadaceae	117	Bean, Wild	79, 80
Asclepias	118	Bearberry	110
Ascyrum	96	Beard-tongue	137
Ash, Black	115	Bedstraw	142, 143
" Mountain	72	Beech	43
" Prickly	87	" -drops	140
" Red	115	" Family	41
" White	115	" Fern	8
Asparagus	28	Beggar Lice	122
Aspen, Large-toothed	37	" Ticks	164
" Quaking	38	Belamcanda	33
Asperugo	122	Bellflower	147
Asphodel, Bog	31	" Family	146
Aspidium	7	" Marsh	147
Asplenium	6	Bellis	169
Aster	157, 171-175	Bellwort	30
" Golden	167	Bent Grass	18
" Salt Marsh	157	Benzoin	62
" White-topped	171	Berberidaceae	62
Atriplex	50, 51	Berberis	62
Avena	16	Bergamot, Wild	125
Avens	76, 77	Berteroa	67
" Purple	75	Betula	40
Azolla	1	Betulaceae	40
Baccharis	158	Bidens	163, 164
Ball Mustard	64	Bignonia Family	140
Ballota	128	Bignoniaceae	140
Balm, Horse	124	Bindweed	119
" Lemon	127	" Black	49
Balsam-apple, Wild	146	Birch	40
Balsaminaceae	93	Birch Family	40
Baneberry	61	Bird Cherry	74
Baptisia	81	Bird's-foot Trefoil	81
Barbarea	65	Birthwort Family	45
		Bishop-weed, Mock	106, 107

Bitter Cress	67, 68	Boneset	159
“ Dock	46	“ False	162
Bitter-nut Hickory	39, 40	Borage	121
Bittersweet	92, 132	Borage Family	121
Black Alder	92	Boraginaceae	121
“ Ash	115	Borago	121
“ Bindweed	49	Botrychium	4, 5
“ Birch	40	Bowman's Root	77
“ Cherry	74	Box Elder	93
“ Haw	145	Bracken	5
“ Horehound	128	Brasenia	56
“ Jack Oak	43	Brassica	65
“ Locust	78	Breweria	119
“ Maple	93	Brier, Green	27, 28
“ Medick	80	Bristly Locust	78
“ Mustard	65	“ Sarsaparilla	105
“ Oak	43	Brome Grass	18
“ Raspberry	73	Bromus	18
“ Snakeroot	107	Brooklime	138
“ Swallow-wort	117	Broom Crowberry	91
“ Walnut	39	“ Scotch	78
“ Willow	38	Broom-rape	140
Blackberry Lily	33	“ Family	139
Black-eyed Susan	168	Broom-sedge	15
Bladder Campion	55	Buckbean	115
“ Fern	6	Buckhorn	141
“ Nut	92	Buckthorn	94
Bladder Nut Family	92	Buckthorn Family	94
Bladderwort	139	Buckwheat	47
Bladderwort Family	139	“ False	49
Blazing Star	32, 161	“ Family	46
Blessed Thistle	156	Buffalo Bur	132
Blite, Sea	50	Bugbane	61
“ Strawberry	51	Bugle Weed	124, 130, 131
Bloodroot	62	Bugloss	122
Bloodwort Family	32	Bull Thistle	156
Bluebell	121	Bulrush	22
Blueberry	112, 113	Bunch-flower	31
Blue Cohosh	62	Bupleurum	105
“ Curls	126, 127	Bur, Buffalo	132
“ Flag	33	“ Cucumber	146
“ Grass	18	“ Marigold	163
Blue-eyed Grass	33	Burdock	156
Blue-joint	16	Burnet	77
Bluets	142	“ Garden	77
Blueweed	121	Burning Bush	92
Boehmeria	45	Bur-reed	10
Bog Asphodel	31	Bur-reed Family	10
“ Rosemary	112		

Bush Clover	84, 85	Castalia	57
" Honeysuckle	144	Castanea	43
Butter-and-eggs	134	Castilleja	135
Buttercup	59	Catalpa	140
Butterfly Pea	79	Catchfly	55
" Weed	118	Catnip	131
Butternut	39	Cat's-ear	152
Button Bush	141	Cat-tail	9
" Snakeroot	105, 106	Cat-tail Family	9
" Weed	142	Caulophyllum	62
		Ceanothus	94
Calacia	162	Cedar, Red	9
Cactaceae	101	" White	9
Cactus Family	101	Celandine	63
Cakile	67	" Lesser	58
Calamagrostis	16	Celastraceae	92
Calla	23	Celastrus	92
Callitrichaceae	90	Celtis	44
Callitriche	90	Cenchrus	17
Calopogon	34	Centaurea	156, 160
Caltha	59	Cephalanthus	141
Camelina	64	Cerastium	54
Campanula	147	Ceratophyllaceae	56
Campanulaceae	146	Ceratophyllum	56
Campion, Bladder	55	Chaff-seed	136
" Red	55	Chain Fern	4, 5
" Starry	55	Chamaecyparis	9
" White	55	Chamaedaphne	111
Camptosorus	5	Chamaelirium	32
Canada Thistle	156	Chamomile	170
Canadian Blue Grass	18	Charlock	65
Cancer-root	140	Cheilanthes	5
Cannabis	45	Chelidonium	63
Caper Family	69	Chelone	137
Capparidaceae	69	Chenopodiaceae	49
Caprifoliaceae	143	Chenopodium	50, 51
Capsella	66	Cherry, Appalachian	74
Cardamine	67, 68	" Bird	74
Cardinal Flower	147	" Black	74
Carex	20	" Choke	74
Carpet-weed	53	" Ground	132
Carpet-weed Family	53	" Pin	74
Carpinus	40	" Sand	74
Carrion Flower	27	" Sour	74
Carrot, Wild	107	Chestnut	43
Carya	39, 40	" Oak	43
Caryophyllaceae	53	Chickweed	54
Cashew Family	91	" Forked	52, 53
Cassia	85	" Mouse-ear	54

Chicory	151	Colic-root	31
Chimaphila	110	Collinsonia	124
Chiogenes	110	Coltsfoot	162
Chokeberry	75	Columbine	57
Choke Cherry	74	Comandra	45
Christmas Fern	6	Comfrey	121
Chrysanthemum	170, 171	" Wild	121
Chrysopsis	167	Commelina	25
Chrysosplenium	70	Commelinaceae	24
Cichorium	151	Compositae	148
Cicuta	107, 108	Composite Family	148
Cimicifuga	61	Coneflower	168
Cinnamon Fern	4	" Gray-headed	168
Cinquefoil	73, 76, 77	Conioselinum	108
" Marsh	75	Conopholis	140
Circaea	103	Conringia	64
Cirsium	156, 157	Convolvulaceae	118
Cistaceae	97	Convolvulus	119
Cladium	22	Coptis	60
Clammy Locust	78	Corallorhiza	34
Clammy-weed	69	Coral-root	34
Clary	125	Corema	91
Claytonia	56	Coreopsis	170
Clearweed	45	Corn Cockle	55
Clematis	60	" Gromwell	122
" Mountain	60	" Salad	146
Cleome	69	Cornaceae	108
Clethra	110	Corn-flower	160
Cliff-brake	5	Cornus	108, 109
Climbing Fern	3	Coronilla	85
" Fumitory	63	Coronopus	66
" Hempweed	159	Corydalis	63
Clintonia	30	Corylus	41
Clitoria	79	Cotton Grass	22
Closed Gentian	116, 117	Cowbane	106
Clover, Alsike	81	Cow-herb	56
" Bush	84, 85	Cow Parsnip	107
" Crimson	81	Cowslip	59
" Hop	80, 81	Cow Wheat	136
" Red	81	Crab Grass	17
" Stone	81	Crack Willow	38
" Sweet	81	Cranberry	110
" White	81	Cranberry Tree	145
" Yellow Sweet	80	Crane-fly Orchis	34
Club Moss	3	Crane's-bill	87
Cnicus	156	Crassulaceae	70
Cockle, Corn	55	Creeper, Trumpet	140
Cocklebur	175, 176	Crepis	154
Cohosh, Blue	62		

Cress, Bitter	67, 68	Dandelion	151
“ Penny	67	“ Dwarf	152
“ Rock	68, 69	“ Fall	152
“ Wart	66	Danthonia	16
“ Water	66	Datura	133
“ Winter	65	Daucus	107
“ Yellow	65, 66	Day-flower	25
Crimson Clover	81	Day Lily	29
Crotalaria	80	Dead Nettle	128
Crotonopsis	89	Decodon	101
Crowberry, Broom	91	Deerberry	112
“ Family	91	Delphinium	57
Crowfoot, Cursed	59	Dentaria	66
“ Family	57	Deptford Pink	55
“ Sea-side	58	Desmodium	82, 84
“ Small-flowered	58, 59	Dewberry	73
“ Water	57	Dianthus	56
Cruciferae	63	Diapensiaceae	113
Cryptogramma	5	Diapensia Family	113
Cryptotaenia	107	Dicentra	63
Cucumber, Bur	146	Dicksonia	7
Cucurbitaceae	146	Diervilla	144
Cudweed	162	Digitaria	17
Culver's Root	138	Diodia	142
Cunila	124	Dioscorea	32
Cuphea	101	Dioscoreaceae	32
Cup Plant	163	Diospyros	114
Curled Dock	47	Diplotaxis	65
“ Mint	131	Dipsacaceae	146
Curls, Blue	126	Dipsacus	146
Curly Grass	1	Dirca	101
Currant	71	Ditch Stonecrop	70
“ Indian	145	Dittany	124
“ Red	71	Dock	46, 47
“ Wild Black	71	Dodder	119
Cursed Crowfoot	59	Dogbane	117
Cuscuta	119	Dogbane Family	117
Cynanchum	117	Dogwood	108, 109
Cynoglossum	121	“ Family	108
Cyperaceae	18	“ Flowering	108
Cyperus	22	Dog-tooth Violet	29
Cypripedium	35	Draba	69
Cystopteris	6	Dragon Root	23
Cytisus	78	Drosera	70
		Droseraceae	69
Dactylis	17	Duckweed	23, 24
Daisy	171	Duckweed Family	23
“ Garden	169	Dulichium	22
Dame's Rocket	68	Dutchman's Breeches	63

Dwarf Dandelion	152	Everlasting	161, 162
" Ginseng	105	" Pearly	162
" Raspberry	73	Evonymus	92
Ebenaceae	114	Fagaceae	41
Ebony Family	114	Fagopyrum	47
Echinochloa	17	Fagus	43
Echinocystis	146	Fall Dandelion	152
Echinodorus	11	False Boneset	162
Echium	121	" Buckwheat	49
Eclipta	170	" Flax	64
Eel Grass	10, 13	" Foxglove	135
Elatinaceae	97	" Gromwell	122
Elatine	97	" Heather	98
Elder	144	" Hellebore	31, 37
" Box	93	" Indigo	78
" Marsh	175	" Mermaid	91
Elecampane	168	" Mermaid Family	91
Eleocharis	22	" Miterwort	71
Eleusine	16	" Nettle	45
Elm	44	" Pennyroyal	130
Elodea	13	" Pimpernel	137, 138
Elymus	18	" Solomon's Seal	31
Empetraceae	91	Featherfoil	113
Empress Tree	134	Fern, Beech	8
Enchanters' Nightshade	103	" Bladder	6
Epifagus	140	" Chain	4, 5
Epigaea	110	" Christmas	6
Epilobium	102, 103	" Cinnamon	4
Epipactis	34	" Climbing	3
Equisetum	2	" Grape	4, 5
Eragrostis	18	" Hay-scented	7
Erechtites	162	" Interrupted	5
Ericaceae	109	" Lady	6
Erigeron	171, 172	" Lip	5
Eriocaulaceae	24	" Marsh Shield	7
Eriocaulon	24	" New York	7
Eriophorum	22	" Oak	7
Erodium	87	" Rattlesnake	4
Eryngium	105, 106	" Royal	5
Erysimum	64	" Sensitive	4
Erythronium	29	" Shield	7
Eupatorium	159, 160	" Sweet	39
Euphorbia	89, 90	" Walking Leaf	5
Euphorbiaceae	89	Ferns and their allies	1
European Alder	41	Fescue Grass	18
Evening Primrose	103	Festuca	18
Evening Primrose Family	102	Fetterbush	112
		Feverfew	170

Feverwort	144	Garlic, Field	30
Field Garlic	30	“ Mustard	68
“ Madder	142	Gaultheria	111
Figwort	137	Gaylussacia	112
“ Family	133	Genista	78
Fimbristylis	22	Gentian	116, 117
Fireweed	102, 162	“ Closed	116, 117
Five-finger	76	“ Family	115
Flag	33	“ Fringed	116
Flax	86	Gentiana	116, 117
“ False	64	Gentianaceae	115
“ Family	86	Geraniaceae	87
“ Wild	86	Geranium	87
Fleabane	171, 172	“ Family	87
“ Marsh	161	Gerardia	135, 136
Floating Foxtail	15	Geum	75, 76, 77
Floating Heart	115	Giant Hyssop	129
Floerkea	91	“ Ragweed	175
Flowering Dogwood	108	Gillenia	77
“ Raspberry	74	Ginger, Wild	45
“ Wintergreen	88	Ginseng, Dwarf	105
Flower-of-an-hour	95	Glasswort	50
Fly Honeysuckle	145	Glaucium	63
“ Poison	32	Glaux	113
Forget-me-not	122	Gleditsia	78
Forked Chickweed	52, 53	Globe-flower	60
Foxglove, False	135	Glyceria	18
Foxtail, Floating	15	Gnaphalium	162
“ Grass	17	Goat's Beard	152
Fragaria	77	“ Rue	86
Fraxinus	115	Golden Alexander	106
Fringed Gentian	116	“ Aster	167
“ Orchis	36	“ Club	23
Frog's Bit Family	13	“ Glow	168
Frostweed	98	“ Ragwort	168
Fumaria	63	“ Saxifrage	70
Fumariaceae	63	Goldenrod	165-167, 171
Fumitory	63	Gold-thread	60
“ Climbing	63	Good King Henry	51
“ Family	63	Gooseberry	71, 72
Galeopsis	128	Goosefoot	50, 51
Galingale	22	“ Family	49
Galinsoga	170	Gourd Family	146
Galium	142, 143	Gramineae	13
Garden Burnet	77	Grape	94
“ Daisy	169	“ Family	94
“ Phlox	120	“ Fern	4, 5
		“ Hyacinth	31

Grass, Arrow	11	Groundsel	157
" Barnyard	17	" Tree	158
" Beach	15	Gum Plant	168
" Bent	18	" Sour	108
" Blue	18	" Sweet	72
" Blue-eyed	33	Gypsophyll	56
" Brome	18	Gysophylla	56
" Canadian Blue	18		
" Cotton	22	Habenaria	36
" Crab	17	Hackberry	44
" Curly	1	Haemodoraceae	32
" Eel	10, 13	Haloragidaceae	104
" Family	13	Hamamelidaceae	72
" Fescue	18	Hamamelis	72
" Foxtail	17	Hardhack	74
" Love	18	Harebell	147
" Manna	18	Hare's Ear	64
" Marsh	17	Haw, Black	145
" Oat	16	Hawkbit	152
" Orchard	17	Hawk's-beard	154
" of Parnassus	71	Hawkweed	155
" Panic	17	Hawthorn	75
" Pepper	67, 68	Hay-scented Fern	7
" Quack	16	Hazel	41
" Scorpion	121, 122	" Witch	72
" Sea	10	Heather, False	98
" Spear	18	Heath Family	109
" Star	32	Hedeoma	124
" Sweet Vernal	15	Hedge Hyssop	138
" Whitlow	69	" Mustard	65
" Wool	22	" Nettle	128, 129
" Yard	16	" Parsley	107
Gratiola	138	Helenium	168
Gray-headed Coneflower	168	Helianthemum	98
Great Dock	47	Helianthus	169
Great Lobelia	147	Heliopsis	163
Green Brier	27, 28	Heliotrope	122
" Hellebore	60	Heliotropium	122
" Milkweed	118	Hellebore, False	31, 37
" Sorrel	46	" Green	60
Greenweed	78	Helleborus	60
Grindelia	168	Helonias	32
Gromwell, Corn	122	Hemerocallis	29
" False	122	Hemlock	9
Ground Cherry	132	" Ground	8
" Hemlock	8	" Parsley	108
" Ivy	131	" Water	107
Ground-nut	79	Hemp	45
		" Indian	117

Hemp, Nettle	128	Hound's Tongue	121
" Water	52	Houstonia	142
Hempweed, Climbing	159	Huckleberry	112
Henbane	132	Hudsonia	98
Hepatica	60	Humulus	44
Heracleum	107	Hyacinth, Grape	31
Herb Robert	87	Hydrangea	72
Herb Sophia	65	Hydrocharitaceae	13
Hercules' Club	105	Hydrocotyle	105
Hesperis	68	Hydrophyllaceae	120
Heteranthera	25	Hydrophyllum	120
Heuchera	71	Hyoscyamus	132
Hibiscus	95	Hypericaceae	96
Hickory	39, 40	Hypericum	96, 97
Hieracium	152, 155	Hypochoeris	152
Hoarhound, Water	124	Hypoxis	32
Hoary Alyssum	67	Hyssop	131
Hobble-bush	145	" Giant	129
Hog Peanut	79, 80	" Hedge	138
Holly	92	Hyssopus	131
" Family	91		
" Mountain	92	Ilex	92
Honewort	107	Illecebraceae	52
Honey Locust	78	Ilysanthes	137, 138
Honeysuckle	144, 145	Impatiens	93
" Bush	144	Indian Cucumber-root	29
" Family	143	" Currant	145
" Fly	145	" Hemp	117
" Japanese	144	" Mustard	65
" Swamp	111	" Pipe	109
" Trumpet	144	" Plantain	162
" Wild	111	" Tobacco	148
Hop	44	" Turnip	23
" Clover	80, 81	Indigo, False	78
" Tree	87	" Wild	81
Hoarhound	126	Inkberry	92
" Black	128	Interrupted Fern	5
Hornbeam	40	Inula	168
Horned Pondweed	10	Ipomoea	119
" Poppy	63	Iridaceae	32
Hornwort	56	Iris	32
" Family	56	" Family	32
Horse Balm	124	Ironweed	161
" Mint	125, 131	" Yellow	168
" Nettle	133	Ironwood	41
" Radish	67	Isanthus	130
Horsetail	2	Itea	71
Horseweed	171	Iva	175
Hottonia	113		

Ivy, Ground	131	Laurel Family	62
" Kenilworth	134	" Mountain	111
" Poison	91	" Sheep	110
		" Swamp	110
Japanese Honeysuckle	144	Lavender, Sea	113
" Knotweed	48	Leadwort Family	113
Jasione	147	Leather-flower	60
Jerusalem Oak	50	Leather-leaf	111
Jimson Weed	133	Leatherwood	101
Joe-Pye Weed	159	Lechea	98
Jointweed	48	Leek, Wild	29
Juglandaceae	39	Leguminosae	77
Juglans	39	Leiophyllum	110
Juncaceae	25	Lemna	23, 24
Juncaginaceae	11	Lemnaceae	23
Juncus	25-27	Lemon Balm	127
Juneberry	75	Lentibulariaceae	139
Juniper	9	Leontodon	152
Juniperus	9	Leonurus	128
		Lepachys	168
Kalmia	110, 111	Lepidium	67, 68
Kenilworth Ivy	134	Lespedeza	84, 85
King Devil	155	Lesser Celandine	58
Knapweed	160	Lettuce, Wild	153, 154
Knawel	52	Leucothoe	112
Knotweed	47, 48	Liatris	161
Knotwort Family	52	Ligusticum	108
Kosteletzkya	95	Lilaeopsis	105
Krigia	152	Liliaceae	27
Kuhnia	162	Lilium	29, 30
		Lily, Blackberry	33
Labiatae	123	" Day	29
Lachnanthes	32	" Family	27
Lactuca	153, 154	" of the Valley, Wild	30
Ladies' Tresses	35	" Pond	57
Lady Fern	6	" Turk's-cap	30
" Slipper	35	" Water	57
Lady's Thistle	156	" Wood	29
Lamb's Quarters	51	" Yellow	30
Lamium	128	Limnanthaceae	91
Laportea	44	Limonium	113
Lappula	122	Limosella	133
Lapsana	152	Linaceae	86
Large-toothed Aspen	37	Linaria	134
Larix	8	Linden Family	95
Larkspur	57	Linnaea	144
Lathyrus	79	Linum	86
Lauraceae	62	Liparis	34

Alp Fern	5	Magnoliaceae	61
Liquidambar	72	Maianthemum	30
Liriodendron	61	Maidenhair	5
Lithospermum	122	Male Berry	112
Live-for-ever	70	Mallow	95
Lizard's Tail	37	" Family	95
Lobelia	147, 148	" Marsh	95
" Family	147	" Rose	95
" Great	147	Malva	95
" Water	147	Malvaceae	95
Lobeliaceae	147	Manna Grass	18
Locust, Black	78	Maple	93
" Bristly	78	" Black	93
" Clammy	78	" Family	92
" Honey	78	" Mountain	93
Lonicera	144, 145	" Red	93
Loosestrife	101, 114	" Silver	93
" Family	101	" Sugar	93
" Swamp	101	Marigold, Bur	163
Lophiola	32	" Water	163
Lophotocarpus	13	Marjoram, Wild	130
Lopseed	140	Marrubium	126
" Family	140	Marsh Bellflower	147
Lotus	56, 81	" Cinquefoil	75
Lousewort	135	" Elder	175
Love Grass	18	" Fleabane	161
Ludvigia	102, 103	" Grass	17
Lupine	80	" Mallow	95
Lupinus	80	" Pea	79
Luzula	25	" Pennywort	105
Lychnis	55	" Pink	116
Lycium	131	" Shield Fern	7
Lycopersicon	132	" Speedwell	138
Lycopodium	3	" St. John's-wort	96
Lygodium	3	Matricaria	158, 170
Lycopsis	122	Matrimony Vine	131
Lycopus	124	May Apple	62
Lyonia	112	Mayweed	170
Lysimachia	114	Meadow Beauty	102
Lythraceae	101	" Parsnip	106
Lythrum	101	" Rue	61
		" Sweet	75
Maclura	44	Medeola	29
Madder Family	141	Medicago	80
" Field	142	Medick, Black	80
Mad-dog Skullcap	126	Melampyrum	136
Madwort	122	Melanthium	31
Magnolia	61	Melastomaceae	102
" Family	61	Melastome Family	102

Melilotus	80, 81	Mouse-ear	152, 155
Melissa	127	" Chickweed	54
Menispermaceae	62	Mountain Ash	72
Menispermum	62	" Clematis	60
Mentha	131	" Holly	92
Menyanthes	115	" Laurel	111
Mercury, Three-seeded	89	" Maple	93
Mermaid Weed	104	" Mint	130
Mertensia	121	Mud Plantain	25
Mexican Tea	50	Mudwort	133
Mezereum Family	101	Mulberry	44
Microstylis	34	Mullein	133
Mignonette Family	69	" Moth	133
Mikania	159	Muscari	31
Milfoil, Water	104	Musk Flower	135
Milkweed	118	Mustard, Ball	64
" Family	117	" Black	65
" Green	118	" Family	63
Milkwort	88	" Garlic	68
" Family	88	" Hedge	65
" Sea	113	" Indian	65
Mimulus	135, 137	" White	65
Mint	131	" Wormseed	64
" Curled	131	Myosotis	121, 122
" Family	123	Myrica	39
" Horse	125, 131	Myricaceae	39
" Mountain	130	Myriophyllum	104
Mitchella	142	Myrtle, Sand	110
Mitella	71	Naiad	10
Miterwort	71	Najadaceae	10
" False	71	Najas	10
Mock Bishop-weed	106, 107	Narthecium	31
" Orange	72	Nelumbo	56
Mocker-nut Hickory	39, 40	Nemopanthus	92
Mollugo	53	Nepeta	131
Monarda	124, 125	Neslia	64
Moneywort	114	Nettle	45
Monkey Flower	137	" Dead	125
Monotropa	109	" False	45
Moonseed	62	" Family	44
" Family	61	" Hedge	128, 129
Moosewood	93	" Hemp	128
Morning Glory	119	" Horse	133
" Family	118	" Wood	44
Morus	44	New Jersey Tea	94
Moss, Club	3	New York Fern	7
" Pink	120	Nicandra	133
Moth Mullein	133	Nicotiana	132
Motherwort	128		

Nightshade	133	Oxalidaceae	86
" Enchanters'	103	Oxalis	86, 87
" Family	131	Ox-eye	163
Ninebark	74	Ox-tongue	152
Nipple-wort	152	Oxypolis	106
Nodding Pogonia	37		
Nymphaea	57	Painted Cup	135
Nymphaeaceae	56	Painted Trillium	29
Nymphoides	115	Pale Dock	46
Nyssa	108	Panax	105
		Panicum	17
Oak	41, 44	Panic Grass	17
" Fern	7	Papaver	62, 63
" Jerusalem	50	Papaveraceae	62
Oakesia	30	Parietaria	44
Oats	16	Parnassia	71
Oat Grass	16	Parsley Family	105
Obolaria	116	" Hedge	107
Oenothera	103, 104	" Hemlock	108
Oldenlandia	142	" Sea	108
Oleaceae	114	Parsnip, Cow	107
Olive Family	114	" Meadow	106
Onagraceae	102	" Water	106
Onion, Wild	30	" Wild	106
Onoclea	4	Partridge Berry	142
Onopordum	156	" Pea	85
Onosmodium	122	Pastinaca	106
Ophioglossum	4	Pasture Thistle	157
Opuntia	101	Patience Dock	46
Orache	51	Paulownia	134
Orchard Grass	17	Pea, Beach	79
Orchidaceae	33	" Butterfly	79
Orchis	34	" Marsh	79
" Crane-fly	34	" Partridge	85
" Family	33	Peanut, Hog	79, 80
" Fringed	36	Pear, Prickly	101
" Rein	36	Pearly Everlasting	162
" Showy	34	Pearlwort	54
Origanum	130	Pedicularis	135
Ornithogalum	31	Pellitory	44
Orobanchaceae	139	Peltandra	23
Orobanche	140	Pencil Flower	81
Orontium	23	Penny Cress	67
Orpine Family	70	Pennyroyal	124
Osage Orange	44	" False	130
Osmunda	45	Pennywort	116
Osmorhiza	107	" Marsh	105
Ostrya	41	Pentstemon	137
Oswego Tea	124	Penthorum	70

Pepper Family	37	Pinus	8, 9
" Grass	67, 68	Pinweed	98
Pepperbush, Sweet	110	Pipe, Indian	109
Peppermint	131	Piperaceae	37
Perilla	127	Pipewort	24
Periwinkle	117	" Family	24
Persimmon	114	Pitch Pine	9
Phaseolus	79	Pitcher Plant	69
Phegopteris	78	" Family	69
Philadelphus	72	Plane Tree Family	72
Phleum	15	Plantaginaceae	140
Phlox	120	Plantago	141
" Garden	120	Plantain	141
Phragmites	16	" Family	140
Phryma	140	" Indian	162
Phrymaceae	140	" Mud	25
Physalis	132	" Rattlesnake	34
Physocarpus	74	" Water	11
Phytolacca	52	Platanaceae	72
Phytolaccaceae	52	Platanus	72
Picea	9	Pluchea	161
Pickereel-weed	25	Plum, Beach	74
" Family	25	" Wild	74
Picris	152	Plumbaginaceae	113
Pig-nut Hickory	39, 40	Poa	18
Pigweed	52	Podophyllum	62
Pilea	45	Podostemaceae	70
Pimpernel	114	Podostemum	70
" False	137, 138	Pogonia	36, 37
" Water	113	" Nodding	37
Pinaceae	8	" Whorled	36
Pineapple Weed	158	Poison Ivy	91
Pin Cherry	74	" Samach	91
" Oak	43	Pokeweed	52
Pine Family	8	" Family	52
" Pitch	9	Polanisia	69
" Prince's	110	Polemoniaceae	119
" Scrub	8	Polemonium Family	119
" White	8	Polygala	88
" Yellow	9	Polygalaceae	88
Pinesap	109	Polygonaceae	46
Pinweed	97	Polygonella	48
Pink, Deptford	56	Polygonatum	28
" Family	53	Polygonum	47, 49
" Marsh	116	Polypodium	7
" Moss	120	Polypody	7
" Swamp	32	Polystichum	6
" Wild	55	Pond Lily	57

Pondweed	10	Radicula	65-67
" Family	10	Radish, Horse	67
" Horned	10	" Wild	65
Pontederia	25	Ragweed	175
Pontederiaceae	25	" Giant	175
Poplar	38	Ragwort, Golden	168
" Swamp	38	Ranunculaceae	57
" White	38	Ranunculus	57-59
Poppy	62, 63	Raphanus	65
" Family	62	Raspberry	73
" Horned	63	" Black	73
Populus	37, 38	" Dwarf	73
Portulaca	56	" Flowering	74
Portulacaceae	56	Rattle-box	80
Post Oak	44	Rattlesnake Fern	4
Potentilla	72, 75-77	" Plantain	34
Prenanthes	153	Rattlesnake-root	153
Prickly Ash	87	Red Ash	115
" Pear	101	" Birch	40
Primrose, Evening	103	" Campion	55
" Family	113	" Cedar	9
Primulaceae	113	" Clover	81
Prince's Feather	48	" Maple	93
" Pine	110	" Mulberry	44
Proserpinaca	104	" Oak	43
Prunella	127	" Sorrel	46
Prunus	74	" Spruce	9
Psedera	94	Red-root	32
Ptelea	87	Reed	16
Pteris	5	Rein Orchis	36
Ptilimnium	105, 107	Reseda	69
Pulse Family	77	Resedaceae	69
Purple Avens	75	Rhamnaceae	94
Purslane	56	Rhamnus	94
" Family	56	Rhexia	102
" Sea	53	Rhododendron	111
" Water	102	Rhodora	111
Putty Root	34	Rhus	91
Pycnanthemum	130	Ribes	71, 72
Pyrola	109	River Weed	70
Pyrus	72, 75	" " Family	70
Pyxidanthra	113	Robinia	78
Pyxie	113	Rock Cress	68, 69
		Rocket, Dame's	68
Quack Grass	16	" Sand	65
Quaking Aspen	38	" Sea	67
Quassia Family	87	" Wall	65
Quercus	41-44	Rock-rose Family	97

Rosa	73	Samolus	113
Rosaceae	72	Sand Cherry	74
Rose	73	" Myrtle	110
" Family	72	" Rocket	65
" Mallow	95	" Spurrey	53
" Swamp	73	Sandalwood Family	45
" Wild	73	Sandbur	17
Rosemary, Bog	112	Sandwort	54
Rotala	101	Sanguinaria	62
Roubieva	50	Sanguisorba	77
Royal Fern	5	Sanicula	107
Rubiaceae	141	Santalaceae	45
Rubus	73, 74	Saponaria	56
Rudbeckia	168	Sarracenia	69
Rue Anemone	61	Sarraceniaceae	69
" Family	87	Sarsaparilla, Bristly	105
" Goat's	86	" Family	104
" Meadow	61	" Wild	105
Rumex	46, 47	Sassafras	62
Ruppia	10	Satureja	126, 127
Rush	25-27	Saururus	37
" Beak	22	Savory	126
" Family	25	Saxifraga	71
" Scouring	2	Saxifragaceae	70
" Spike	22	Saxifrage	71
" Twig	22	" Family	70
" Wood	25	" Golden	70
Russian Thistle	50	Scarlet Oak	44
Rutaceae	87	Scheuchzeria	11
Rye, Wild	18	Schizaea	1
Rynchospora	22	Schwalbea	136
Sabatia	116	Scirpus	22
Sage, Wild	125	Scleranthus	52
" Wood	126, 127	Sclerolepis	159
Sagina	54	Scorpion Grass	121, 122
Sagittaria	11, 13	Scotch Broom	78
Salad, Corn	146	" Thistle	156
Salicaceae	37	Scouring Rush	2
Salicornia	50	Scrophularia	137
Salsify	151	Scrophulariaceae	133
Salsola	50	Scrub Oak	43, 44
Salt Marsh Aster	157	Scrub Pine	8
Saltwort	50	Scutellaria	126
Salvia	125	Sea Blite	50
Salvinia	1	" Grass	10
Salix	38	" Lavender	113
Sambucus	144	" Milkwort	113
		" Parsley	108

Sea Purslane	53	Snakeroot, Virginia	45
" Rocket	67	" White	159
Sea-side Crowfoot	58	Snapdragon	137
Sedge	20	Sneezeweed	168, 171
" Family	18	Snowberry	110, 145
Sedum	70	Soapwort	56
Seedbox	103	Solanaceae	131
Selaginella	2, 3	Solanum	132, 133
Self-heal	127	Solidago	165-167, 171
Senecio	157, 168	Solomon's Seal	28
Senna, Wild	85	" " False	31
Sensitive Fern	4	Sonchus	154
Serapias	37	Sorrel, Green	46
Sericocarpus	171	" Red	46
Sesuvium	53	" Wood	86, 87
Setaria	17	Sour Cherry	74
Shag-bark Hickory	39, 40	" Gum	198
Sheep-berry	145	Sow Thistle	154
Sheep Laurel	110	Spanish Needles	164
Sheep's bit	147	" Oak	44
Shepherd's Purse	66	Sparganiaceae	10
Sherardia	142	Sparganium	10
Shield Fern	7	Spartina	17
Shin-leaf	109	Spear Grass	18
Showy Orchis	34	Spearmint	131
Sicyos	146	Spearwort	58
Sida	96	Speckled Alder	41
Silene	55	Specularia	146
Silphium	163	Speedwell	138, 139
Silver Maple	93	" Marsh	138
" Weed	76	" Water	138
Silybum	156	Spergula	53
Simarubaceae	87	Spergularia	53
Sisymbrium	65, 69	Spice Bush	62
Sisyrinchium	33	Spider Flower	69
Slum	106	Spiderwort	24
Skullcap	126	" Family	24
" Mad-dog	126	Spikenard	105
Skunk Cabbage	23	Spike Rush	22
Slippery Elm	44	Spiraea	74, 75
Small-flowered Crowfoot ..	58, 59	Spiranthes	35
Small-fruited Hickory ...	39, 40	Spirodela	23
Smartweed	48, 49	Spleenwort	6
Smilacina	31	Spotted Wintergreen	110
Smilax	27, 28	Spring Beauty	56
Smooth Alder	41	Spruce, Red	9
Snake Mouth	37	Spurge	89, 90
Snakeroot, Black	107	" Family	89
" Button	105, 106	Spurrey	53

Squaw-root	140	Swamp Thistle	157
St. Andrew's Cross	96	" White Oak	43
St. John's-wort	96, 97	Sweet Bay	61
" " Family	96	" Cicely	107
" " Marsh	96	" Clover	81
St. Peter's-wort	96	" Fern	39
Stachys	128, 129	" Flag	23
Staff-tree Family	92	" Gale	39
Stagger-bush	112	" " Family	39
Staphylea	92	" Gum	72
Staphyleaceae	92	" Pepperbush	110
Star Flower	114	" Vernal Grass	15
" Grass	32	" William	56, 120
" of Bethlehem	31	Sweetbrier	73
" Thistle	156	Sycamore	72
Starry Campion	55	Symphoricarpos	145
Starwort, Water	90	Symphytum	121
Steironema	114	Symplocarpus	23
Stellaria	54		
Stickseed	122	Taenidia	106
Stone Clover	81	Tamarack	8
Stonecrop	70	Tanacetum	158
" Ditch	70	Tangleberry	112
Stork's-bill	87	Tansy	158
Strawberry	77	Taraxacum	151
" Blite	51	Taxaceae	8
" Bush	92	Taxus	8
Streptopus	28	Tear-thumb	49
Strophostyles	80	Teasel	146
Stylosanthes	81	" Family	146
Suaeda	50	Tecoma	140
Sugar Maple	93	Tephrosia	86
Sumach	91	Teucrium	126, 127
" Poison	91	Thalictrum	61
Sundew	70	Thaspium	106
" Family	69	Thistle	156, 157
Sundrops	104	" Barnaby's	156
Sunflower	169	" Blessed	156
" Tickseed	163	" Bull	156
Swallow-wort, Black	117	" Canada	156
Swamp Dock	46	" Lady's	156
" Honeysuckle	111	" Pasture	157
" Laurel	110	" Russian	50
" Loosestrife	101	" Scotch	156
" Pink	32	" Sow	154
" Poplar	38	" Star	156
" Rose	73	" Swamp	157
		" Yellow	156

Thlaspi	67	Tussilago	162
Thorny Amaranth	52	Tway-blade	34
Thoroughwax	105	Twig Rush	22
Thoroughwort	159, 160	Twin Flower	144
Three-seeded Mercury	89	Twisted-stalk	28
Three-square	22	Typha	9
Thuja	9	Typhaceae	9
Thyme, Wild	127		
Thymelaeaceae	101	Ulmus	44
Thymus	127	Umbelliferae	105
Tiarella	71	Urtica	45
Tick Trefoil	82-84	Urticaceae	44
Tickseed	170	Utricularia	139
" Sunflower	163	Uvularia	30
Tilia	95		
Tiliaceae	95	Vaccinium	110, 112, 113
Timothy	15	Valerian	146
Tipularia	34	Valeriana	146
Toad-flax	45, 134	Valerianaceae	146
Tobacco, Indian	148	Valerian Family	146
" Wild	132	Valerianella	146
Tofieldia	32	Vallisneria	13
Tomato	132	Velvet Leaf	96
Toothwort	66	Venus's Looking Glass	146
Torilis	107	Veratrum	31
Touch-me-not	93	Verbascum	133
" Family	93	Verbena	123
Tradescantia	24	" Family	123
Tragopogon	151, 152	Verbenaceae	123
Trailing Arbutus	110	Vernonia	161
Tree of Heaven	88	Veronica	138, 139
Trefoil, Bird's-foot	81	Vervain	123
" Tick	82-84	Vetch	79
Trichostema	126, 127	Viburnum	145, 146
Tridentalis	114	Vicia	79
Trifolium	80, 81	Vinca	117
Triglochin	11	Viola	99, 100
Trillium	29	Violaceae	98
Triosteum	144	Violet	99, 100
Trollius	60	" Dog-tooth	29
Trumpet Creeper	140	" Family	98
" Honeysuckle	144	Virgin's Bower	60
Tsuga	9	Virginia Creeper	94
Tulip Tree	61	" Snakeroot	45
Tumble Weed	51	" Willow	71
Turkey-beard	32	Vitaceae	94
Turk's-cap Lily	30	Vitis	94
Turtlehead	137		

Wake Robin	29	Whitlow Grass	69
Walking Leaf Fern	5	Whorled Pogonia	36
Wall Rocket	65	Wild Balsam-apple	146
Walnut, Black	39	" Basil	127
" Family	39	" Bean	79, 80
Wart Cress	66	" Bergamot	125
Water Arum	23	" Carrot	107
" Cress	66	" Comfrey	121
" Crowfoot	57	" Flax	86
" Hemlock	107, 108	" Geranium	87
" Hemp	52	" Ginger	45
" Horehound	124	" Honeysuckle	111
" Lily	57	" Hydrangea	72
" " Family	56	" Indigo	81
" Lobelia	147	" Leek	29
" Marigold	163	" Lettuce	153, 154
" Milfoil	104	" Lily of the Valley	30
" " Family	104	" Marjoram	130
" Parsnip	106	" Onion	30
" Pimpernel	113	" Parsnip	106
" Plantain	11	" Pink	55
" " Family	11	" Plum	74
" Purslane	102	" Radish	65
" Shield	56	" Rose	73
" Smartweed	48	" Rye	18
" Speedwell	138	" Sage	125
" Starwort	90	" Sarsaparilla	105
" " Family	90	" Senna	85
Waterleaf	120	" Thyme	127
" Family	120	" Tobacco	132
Water-weed	13	" Yam	32
Waterwort	97	Willow	38
" Family	97	" Black	38
Weeping Willow	38	" Crack	38
White Ash	115	" Family	37
" Birch	40	" Herb	103
" Campion	55	" Oak	41
" Cedar	9	" Virginia	71
" Clover	81	" Weeping	38
" Elm	44	" White	38
" Mulberry	44	Winterberry	92
" Mustard	65	Winter Cress	65
" Oak	44	Wintergreen	111
" Pine	8	" Flowering	88
" Poplar	38	" Spotted	110
" Snakeroot	159	Witch Hazel	72
" Willow	38	" " Family	72
White-topped Aster	171	Withe-rod	146

Wolffia	23	Yarrow	170
Wood Anemone	60	Yellow Alyssum	64
" Lily	29	" Birch	40
" Nettle	44	" Cress	65, 66
" Rush	25	" Flag	33
" Sage	126, 127	" Ironweed	168
" Sorrel	86, 87	" Lily	30
" " Family	86	" Oak	43
Woodsia	7	" Pine	9
Woodwardia	4, 5	" Sweet Clover	80
Wool Grass	22	" Thistle	156
Worm-seed Mustard	64	Yellow-eyed Grass	24
Wormwood	158	" " Family	24
Xanthium	175, 176	Yellow-weed	69
Xerophyllum	32	Yew Family	8
Xyridaceae	24	Zannichellia	10
Xyris	24	Zanthoxylum	87
Yam Family	32	Zizia	106
" Wild	32	Zostera	11
Yard Grass	16	Zygadenus	31